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THE EVOLUTION OF MAN'S DIETARY REQUIREMENTS[1]

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AS PRACTICAL dietitians you are daily concerned with the details of planning or enforcing dietary régimes. You have constantly to calculate the calorific value of food dishes, to consider their contents of fats, carbohydrates and proteins, to avoid irritants and to include components which will tempt jaded appetites without adverse reaction on the pathological states of your patients. Eating, which to the average person is a carefree pastime, has become for you a matter of cold calculation and often of tedious detail. On this occasion of your annual meeting, I presume you are somewhat in a holiday mood. I shall not, therefore, attempt to call you back to your daily routine. Instead of minutely examining further the details of the trees all about us, I invite you to go with me to the top of yonder mountain and get a view of the great expanse of the forest.

The theory of evolution nowadays enters so intimately into the teachings of all biological material that we are prone to accept evolution as a fact and to omit periodic re-examination of the evidence in support of it. The evidence on which we have been most accustomed to rely is of two sorts: anatomical correspondences among the various species of animals and similarities in the structure and appearance of embryos of many, many species at various stages of their development. There is also a large body of more general evidence, such as the barely perceptible gradations in form, function and habit which extend through a range of thousands of species of animals or plants. The sex function is a unifying principle which extends through both kingdoms.

Our theme of today, however, calls our attention to chemical evidences of kinship among the members of the great category of living things. Some of these evidences are, I am sure, already familiar to you, but I believe you will be impressed with their weight if we undertake a more or less systematic review of them. Chemical correspondences often extend to minutest details amounting to identity with respect to a thousand particulars, for which it is statistically impossible to account except on the basis

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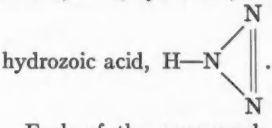
of a common inheritance. Chemical evidence is also more satisfying because it serves to establish a common inheritance not only for the category of higher animals as is the case for morphology but even in some degree relates *homo sapiens* to the lowly lichen that grows on the stones in his garden and to which he presents no morphological resemblance.

To aid you in appreciating the astounding chemical correspondences in nature, I must first outline to you some salient features of the architecture of molecules. Probably most of you are aware that inorganic nature is composed of relatively simple molecules. These are, for the most part, compounds of the oxides of abundant elements, such as calcium, silicon, aluminum, iron and magnesium, each comprising a total of rarely more than a dozen atoms. Moreover, sequences of identical atoms rarely exist. For this reason, molecular architecture of inorganic substances has received little attention and indeed has little significance. One can adequately distinguish one molecule from another by the proportions of the several elements which they contain.

Organic nature presents a wholly different picture. Glue and beefsteak analyze alike; starch and sugar have precisely the same composition. How shall we account for the obvious differences between the first and second member of each pair? It must be a matter of arrangement, since the atoms are alike in kind and proportion. Such considerations have taught us that organic matter is made up of central skeletons of carbon atoms, each exactly like its neighbor. The unique property which carbon exhibits is that of uniting with itself to form long chains which may be straight or forked, or cross-linked, or may turn upon themselves to form single or multiple ring systems. Often they entice a single atom of nitrogen, oxygen or sulfur to join their circle and thus to add to the variety of the patterns they produce. Each carbon has four valences and on each of its four sides it may link itself to other carbon atoms or occasionally to other atoms of approximately equal or greater weight. Elsewhere and all through the pattern are interspersed large numbers of the much lighter hydrogen atoms. Hydrogen literally encases the carbon chains which make up the skeletons.

Let us make the consequences of this peculiarity of carbon compounds clear by a few simple examples. A contrast between the compounds of nitrogen and hydrogen on the one hand and those of carbon and hydrogen on the other will be useful. There are only three compounds of nitrogen and hydrogen: ammonia, NH_3; hydrazine, $NH_2 \cdot NH_2$; and hydrozoic acid,  .

Each of the compounds of nitrogen and hydrogen differs from the others in the proportions of the two elements. We need nothing further to distinguish them and do not need to bother with their architectural patterns. Quite the reverse is true of the compounds of carbon and hydrogen. There are thousands of these having identical or nearly identical proportions of the elements and we can distinguish them only by their architectural patterns. Isomerism is the term applied to this phenomenon of identical composition and differing

patterns and properties. Let us take, as an elementary example, ordinary alcohol and dimethyl ether:

$CH_3CH_2OH = C_2H_6O$ alcohol b. pt. 78.4°

$CH_3—O—CH_3 = C_2H_6O$ dimethyl ether b. pt. −23.7°

Their compositions are identical, but their physical, chemical and physiological properties are wholly different.

As the complexity of the molecule rises, the possible number of isomers increases in geometric proportion. Thus there are only 3 possible isomeric compounds of the composition C_5H_{10}, but there are 75 isomers of the composition $C_{10}H_{20}$, 159 isomers of $C_{11}H_{22}$, 802 isomers of $C_{13}H_{26}$ and 1855 isomers of $C_{14}H_{28}$. If we consider compounds of three elements—for example, carbon, hydrogen and oxygen—the number of possible isomers rises much more rapidly. Consequently when we encounter a complex organic compound recurring at all levels of evolutionary development, we must reflect that those same atoms might have arranged themselves in a great variety of ways. Evolutionary kinship furnishes the only possible explanation of the fact that so many forms of life have actually arranged them in identically the same way.

Let us now consider the simple sugar, glucose, which occurs in the blood stream of all animals and in the cell saps of plants. It contains a short chain of only six carbon atoms to which oxygen and hydrogen atoms are joined in the proportions CH_2O. Yet there are 24 known isomers of glucose of which I shall indicate only three for purposes of illustration (Fig. 1).

Now when we find such an identical substance predominating in living tissues wherever we turn, we are convinced that its occurrence is no accident. Of course, several of the other 24 six-carbon atom sugars also occur in one tissue or another, but sporadically and in reserve stores rather than in the active cells. The green plants as a class make glucose from carbon dioxide by first reducing it to formaldehyde and then polymerizing formaldehyde to the sugar. From the sugar they make starch and cellulose. The animal world degrades the carbohydrates and proteins of its food to glucose and then burns the

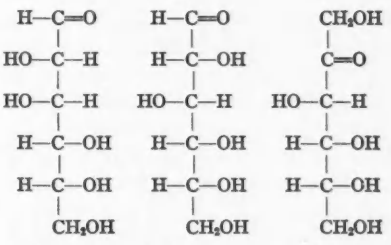
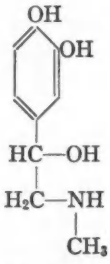


FIG. 1

glucose as the source of vital heat and mechanical work. This example is appropriately given first, for no substance more fundamental than glucose can be found in the economy of nature.

Many of the most striking chemical comparisons among animals pertain to endocrinology. The glands of internal secretion elaborate definite chemical substances called hormones. These substances, transported through the blood stream, excite physiological function at some distant and appropriate point. The chemical structure and precise identity of many of them are still unknown, though their existence and func-

tion are generally accepted. For brevity we will confine our discussion to the more familiar ones. The first to be isolated was adrenaline (Fig. 2) in 1897. It is elaborated by the anterior portion of a tiny capsule on the top of the kidney of all vertebrates and plays an important role in all the higher forms of animal life. Emotions of fear or rage stimulate its secretion by the adrenals. Carried through the blood stream of dog or man, it causes the hair to rise, increases the blood pressure, strengthens and hastens the heart beat, constricts the blood vessels and increases the sugar content



Epinephrin or Adrenaline

FIG. 2

of the blood. The animal is thus prepared for the contest which its emotion presages. Increased blood flow and blood sugar provide for nutrition of the muscles in the anticipated violent physical exertion. Constriction of the blood vessels is a provision against the bleeding of wounds that may be sustained. Who can doubt that the more elemental emotions of mice and men, and that of dogs, are derived from their common chemical inheritance and common experiences of evolutionary history?

Adrenaline effects the primary chemical control of the sympathetic nervous system. Acetyl choline (Fig. 3) plays a somewhat similar role as to the parasympathetic nerves which control, among other things, the muscles of the alimentary tract and thus have much to do with processes of digestion and elimination. The injected substance acts similarly on all the higher forms of animal life. Like adrenaline, its structure is highly specific. The atoms in it might have been disposed in a hundred different ways, but disarrange a few atoms in this molecule and physiological action is lost for all species alike.

The action of these two neurohormones has been revealed by researches of the past few years but much is yet to be learned. The electrical impulses which flow along nerves do not have the

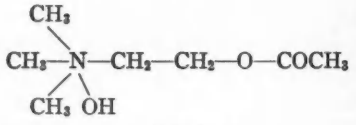


FIG. 3

velocity of electromagnetic waves. They more resemble catalytic chain reactions. Dip an iron wire in strong nitric acid and for some moments nothing happens. Gas bubbles start to form at some point which may be predetermined by scratching the wire. Once initiated, the impulse to form gas travels at high but visible speed along the wire like the crest of a wave, leaving passive metal in its trough behind. The temperature coefficient of the velocity of this wave is identical with that of electrical impulses along nerves and it is now supposed that such a catalytic wave along the nerve fiber generates an action substance at its terminus in the brain. So an artificially generated electrical impulse in a parasympathetic

nerve causes it to exude acetyl choline at its further end. A bit of smooth muscle at its terminus can thus be set in contractile motion just as it can by adding synthetic acetyl choline to the medium. Incidentally but probably significantly, there flows out from the stimulated nerve end, and with the acetyl choline, vitamin B_1 in proportions eighty times as great as from a resting nerve end.

Another hormonal substance of equally wide significance in the animal world is thyroxine, the product of the thyroid gland which controls the basal metabolic rate. Partial extirpation of the gland leads to similar results in a wide variety of animal species. The metabolic rate, the pulse rate and the temperature fall; the animal becomes sluggish and develops a dry skin and falling hair. Shortage in early life dwarfs physical and mental growth. Excess thyroxine stimulates metabolism and hastens development. Thus the metamorphosis of tadpoles which have achieved only the size of flies, may be hurried by thyroxine to produce frogs.

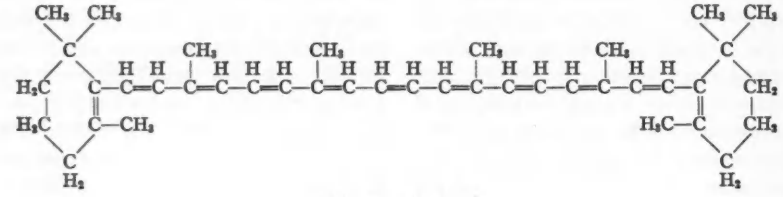
The existence of vision in animals is one of the outstanding marvels of Nature. That the light reflected from a distant object can produce a faithful image in the consciousness of creatures at humble levels of the evolutionary scale seems to the reflective mind a miracle of adaptation. If all life were to be wiped out and the whole drama of evolution re-enacted, would sight come again to the earth? If so, would Nature employ new agencies or resort again to her lost art? That the latter might be the case is suggested by the fact that the photochemistry of vision appears to be alike wherever we encounter it.

The retinas of most vertebrates contain two groups of light receptors distinguished by their shapes as rods and cones. The rods function in dim light; the cones, in bright. Both rods and cones contain closely related photopigments which comprise a carotenoid in combination with a protein. Just as light affects the silver halide in your camera film and makes a picture from the varying darkness of the resulting silver particles, so light bleaches these pigments in each microscopic rod and cone to make an image on the retina which is somehow transferred along the optic nerves to our brains and our consciousness. The photopigment of the rods is called rhodopsin or visual purple. It is a compound of a giant protein molecule with a molecule of vitamin A. After exposure to light, this compound is partly split into free protein and free vitamin A. The two cleavage products, however, are constantly recombining. In the dark, the recombining process overtakes the splitting process so the eye is ready to see again.

Before discussing further the function of vitamin A in the rods, let us refer briefly to the cones which contain a closely related violet pigment called iodopsin which also bleaches to a substance which is probably a simple derivative of vitamin A. Its chemistry is yet to be fully worked out. In chickens, color vision is achieved by light filters consisting of a tripartite system of colored oil globules. Wald has fractionated from these globules a red hydrocarbon, astacene, the substance which gives the characteristic color to a boiled lobster, the golden xanthophylls, lutein and zeaxanthin, which give also color to the yolks of chicken eggs and an

unidentified greenish yellow carotene which appears to be identical with the coloring matter of the bacterium *Sarcina lutea*.

Let us now observe the molecular structure of carotene, the yellow coloring matter of carrots from which the name is derived (Fig. 4). From carotene the animal body can and regularly does derive vitamin A (Fig. 5) by splitting it into two in the middle and introducing



β-Carotene (Karrer)

FIG. 4

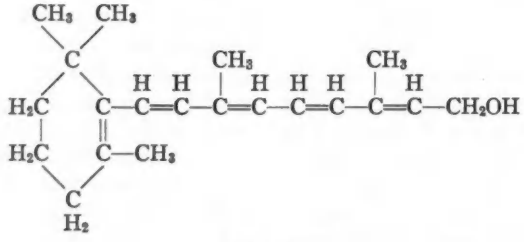


FIG. 5

the hydroxyl group, OH. There are many other carotenoids similar in structure to carotene or vitamin A but differing from them in the length of the side chain, the position of the double bonds in the side chain and in the number of hydroxyl groups on it.

It is now clear that all vertebrates have constructed their visual systems by elaboration of a single theme. The isolation and identification of visual pigments is difficult chemistry and little has been done with the lower forms of life. Rhodopsin has recently been found in large quantities in the eye of a squid and such other fragmentary evidence as exists strongly suggests that some other invertebrates see by a closely kindred mechanism. Some variations are probably to be expected. One has already been encountered among the vertebrates. Although all ocean fishes have vitamin A in their eyes (and livers), most fresh water fish, even those closely related morphologically to their ocean cousins, have vitamin A_2 instead. Some have a mixture of the two vitamins which are, however, very similar and differ from one another only in the length of the carbon side chain. A_2 has two more carbon atoms and one more pair of double bonds than A_1. This slight difference only gives added point to our

theme that the *essential* mechanism is identical for all eyes the chemistry of which has been studied.

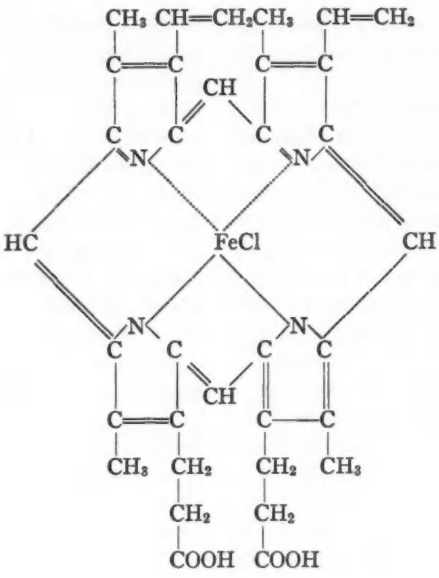
This matter of vision is a good starting point for the next step in our argument, that of relating animals to plants through their chemical mechanisms. Were I a poet I should delight you with a metered presentation of the fancy that our sense of beauty is born of the common chemistry which is enfolded in our eyes themselves and in the flowers and foliage which ravish our senses. It seems to me a worthy theme but perhaps we should not like to have our aesthetic feelings analyzed. Our male appreciation of feminine beauty, I am sure, is in part a matter of chemistry but I fear it would not do to ascribe my lady's charm to so many parts per million each of theelin, theelol and of α and β progesterone. The meter of such a love sonnet would at least be difficult.

Whether or not we see beauty in verdant landscapes because our eyes mystically sense a kinship with the colors of the scene, the kinship is nevertheless there. If one prepares a water-free extract of the pigments of leaf or flower, protecting them the while from atmospheric oxidation, he can effect a beautiful separation of them into their principal class components, by simple means. It is only necessary to filter the extract slowly through a close packed column of fine chalk and color bands appear which become sharper as more fluid passes through. At the bottom are the yellow carotene bands which may be driven lower by pouring still more fresh solvent through the filter till they collect in the flask at the bottom. From carotene, as we have already seen, all animal life is able to derive vitamin A. Without it there ensues blindness and general failure of the body mechanism.

Next, above the carotene band in our filter column are the reddish orange xanthophylls whose chemistry is unfortunately less well understood. They are, however, related to the hydrocarbon carotenes and differ from them principally by being dialcohols. (Vitamin A is a carotene monoalcohol.) Among the xanthophylls which have been isolated is the red pigment of the tomato, lycopin, and fuco-xanthin which colors the brown algae in our ponds. Another xanthophyll has already been mentioned as an essential component of the light filter of a chicken's eye and also as present in the yolk of its egg.

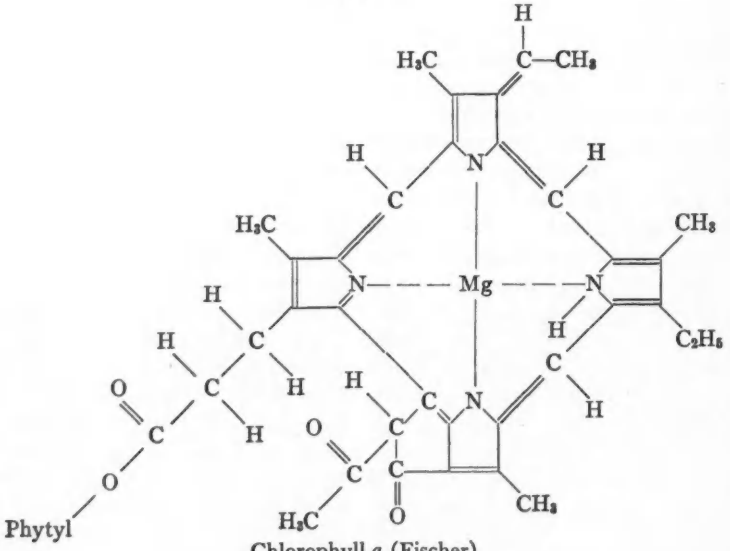
Above the xanthophylls in our filter column appear the green bands of the chlorophylls. Here is the spectrum of Nature's color beauty: the yellow of the carotenes, the reds of the xanthophylls and the blue greens of the chlorophylls. Herewith she bedecks the flowers, fruits, and foliage of her myriad higher plants and has some to spare for the wattles of the turkey and for the bodies of inconspicuous and forgotten primitive bacteria, mosses, and fungi.

Already I hear you protest, "At least you can't find chlorophyll in our eyes. They are not green." I don't have to. It's in your blood—at least a huge portion of its molecular skeleton is there. Here in Fig. 6 you see hemin which is the prosthetic group or business end of the hemoglobin of mammalian blood. You will note the four pyrrole rings joined in a giant circle with four intervening CH groups. At the center is an atom of iron which is "it" in this game of ring-around-the-rosy. In Fig. 7



Hemin

FIG. 6



Chlorophyll *a* (Fischer)
Phytyl radical = $C_{20}H_{39}$

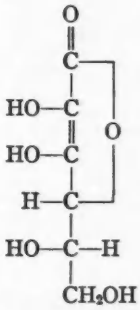
FIG. 7

you see the molecule of chlorophyll and note the same players in the game except that now magnesium is "it". It is true that some of the little girls have different ribbons on their pigtails, but you could not mistake their identity.

Their common structural element is known as porphyrin. This skeleton recurs again and again in the breathing systems of plant and animal life as an integral part of the substances which we have come to refer to as the respiratory pigments. When the hemin of blood is heated with soda lime, porphyrin is obtained identical in every detail with the porphyrin derived from chlorophyll. When you peel an apple with a steel knife and see the fresh cut surface darken presently in the air, you are witnessing the action of a porphyrin-containing oxidase. Put a drop of hydrogen peroxide on the surface and watch the oxygen evolve due to another porphyrin-base enzyme of the apple or of most any other vegetable tissue. It is called catalase.

Another well nigh if not universal constituent of tissues is cytochrome which may be recognized with a spectroscope by its absorption bands associated with its porphyrin nucleus. If yeast is kept from contact with the air the cytochrome bands appear strongly. They fade and return as oxygen is admitted and again excluded. Choke a wax moth and the absorption bands of cytochrome appear throughout its body tissues, the more quickly as its struggles exhaust its internal oxygen supply. Let it breathe freely again and the bands disappear. Cytochrome is one of a number of links in the chain whereby glucose is oxidized by living tissues. It serves to transfer oxygen from the air to the food molecule which is to be oxidized.

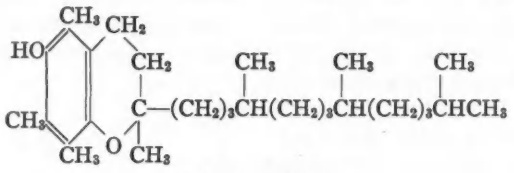
There are many other mechanisms common to plants and animals. Briefly we surmise that every one of the vitamins represents such an example. Vitamin C (Fig. 8) is a characteristic constituent of plants during growth but not during dormancy. Sprout a seed and vitamin C appears overnight. It is also present in the tissues of animals, especially in their livers. Vitamin E (Fig. 9) of the wheat embryo and lettuce leaf is essential for the fertility of mammals. Oestrone (Fig. 10), a mammalian female sex hormone, produces visible stimulation of the growth of young pea seedlings. These and other fragmentary observations of kinship are merely foil to the brilliant examples which are furnished by three other vitamins, B_1, B_2 and nicotinic acid. B_1, or the anti-beriberi vitamin, is the one with which I have had the good fortune to be associated most of my life. No other vitamin quite equals it in the profundity and universality of its essential action. It is present in every living tissue which



Ascorbic Acid
(Vitamin C)

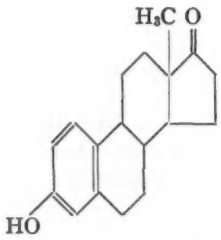
FIG. 8

has been critically examined. It is demonstrably required not only by every common mammalian species including man but is also indispensable for flies, beetles, certain worms, bacteria, molds, fungi and yeasts. The higher plants fabricate hundreds of tons of it annually and store it in their seeds in quantity. Without it the sprouting seed can not form a root system. This may be demonstrated by sprouting tomato seeds



Alpha tocopherol

FIG. 9



Oestrone (theelin)

FIG. 10

in water and cutting off the rootlets when they have grown to a length of a half inch or so. The severed roots are then transferred to a solution of pure sugar and small amounts of nutrient salts. No further growth of the rootlets occurs unless vitamin B_1 is also added to the solution. If added in amounts ranging from one part in 40 million million to one part in 40 million, growth of the roots occurs in proportion to the amount added. The structure of this all-pervading component of living things is shown in Fig. 11. It acts as a component of an enzyme system essential to the final stage of glucose metabolism, a process which is essentially alike for the yeast cell and for our own muscles.

Vitamin B_2 has had less publicity because a deficiency of it in foods is sufficiently rare that no severe and widespread human disease has arisen from this cause. That we could produce one of fatal consequences by proper scalping of our foodstuffs is beyond question. It, too, enters into an enzyme of one of the widespread oxidative mechanisms of living things. Its structure is shown in Fig. 12.

Nicotinic acid has been shown within the past three years to be the anti-pellagra vitamin. Thousands of people have died in the insane asylums of our South for lack of it. Thousands more are suffering from the disease in varying degrees of severity today. It is an old and familiar substance, having been first prepared in 1873 by the oxidation of nicotine. It has also been known for thirty years to be present in foods, but no one suspected till three years ago that it played an important role in them. It is the prothetic group of cozymase which floats alike in our blood streams and in the fluid contents of tiny yeast

cells. Without it neither pus-forming bacilli, tomato plants, nor men can long survive. The structure of nicotinic acid is shown in Fig. 13.

Another member of the vitamin B complex known as vitamin B_6 or pyridoxin has been isolated and was identified last year as the structure shown in

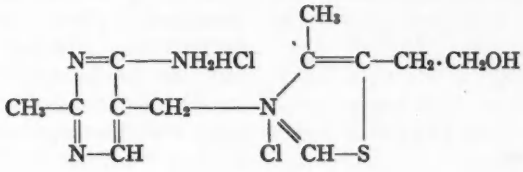
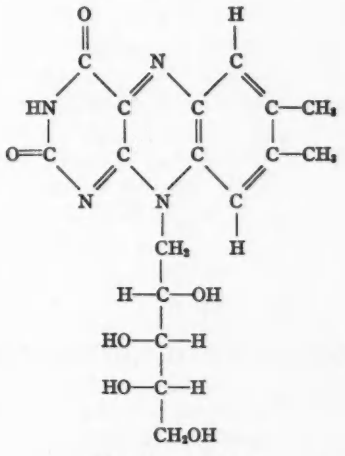


FIG. 11

Fig. 14. It is essential for the growth of rats and prevents a distinctive dermatitis which was long supposed to be equivalent to human pellagra. This is not so, but there is evidence that vitamin B_6 is needed by human beings and the synthetic substance is proving of value in the therapy of deficiency conditions. The utility of this substance for a few plants and micro-organisms has been tested at a venture. The results indicate that it promotes growth in the plant kingdom as well as in animals. Tomato roots and certain molds, for example, need it for good growth.

Each year adds new examples to the list of these general promoters of life processes. The latest is pantothenic acid. Its history presents a contrast to that of B_6. Whereas B_6 was first recognized as an animal growth factor and later found useful for plants, pantothenic acid was recognized as an essential for yeast for ten years before it was recognized as a vitamin required by animals. It turns out to be a "filtrate factor" for which animal experimenters had been searching in the course of their exploration of the vitamin B complex. Its structure appears in Fig. 15. It is used alike by yeast cells, lactic acid bacteria, alfalfa seedlings, rats and doubtless also by man. Only the plant world, however, can make it. More and more, we who



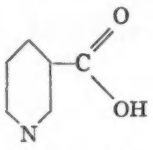
Riboflavin (Kuhn)

FIG. 12

have long boasted ourselves as lords of creation find that we are also mendicants in Nature's bread line and heirs of the grass of the fields.

It is obvious that the plants do not elaborate these mechanisms that we may be fed, but that they may thrive. The use of vitamins by animals is therefore

a form of parasitism. Such a parasitism is particularly conspicuous in the case of vitamin B_1 or thiamin which has been more extensively studied than many of the vitamins. Thiamin has been found to be present in the tissues of many hundreds of plants, including bacteria, fungi, yeasts and algae. It seems always to be present in leaves,



Nicotinic acid

FIG. 13

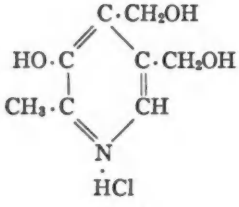


FIG. 14

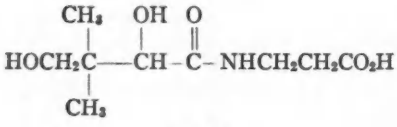


FIG. 15

even in dead autumn leaves; it has been found in the petals, stamens, pistils and pollen of flowers and is believed to play a part in the fertilization of the ovaries by pollen. The green plants fabricate tons of it each year by the aid of sunlight. The first lush growth of spring grasses is particularly rich in it. Many of the lower plants, such as yeasts, can also make it if they are supplied with a minute capital stock to begin with. Yeasts, however, usually prefer to sponge on the higher plants and derive most of their thiamin from the grain worts in which they grow. The yeasts are very greedy for thiamin and build up large reserves within their cells in proportion to the thiamin content of the medium.

As might be expected, thiamin is present everywhere in fertile soil and has been found even to a depth of seven feet. Because of its availability from the decaying remains of other plants, many lower plants have either failed to develop the capacity to synthesize thiamin or have lost that capacity if they once possessed it. Several molds, such as *Phycomyces*, are quite dependent on the synthetic activity of other plants. So also is *Staphylococcus*, the common pus-forming parasite of man.

Another form of parasitism is illustrated by tomato roots which cannot make thiamin but are dependent on the seed which in turn got its supply from the activity of the leaves.

The reader will recall that in the experiment above cited the extent and vigor of growth of tomato roots depends on the amount of thiamin supplied. This is no isolated instance but a widely prevalent phenomenon. The use of thiamin for garden plants is based upon the fact that Nature's total supply of thiamin, while widely distributed, is sometimes too scanty for luxuriant growth. This is also true to some extent for animals. Rats or pigeons will survive for months on a low thiamin intake, but they grow faster, attain larger size and reproduce better, progressively, as the intake is multiplied even up to tenfold.

The reasons for this proportionality

of growth to thiamin intake are in all probability to be found in the common utilization of glucose by all living things. We know that the process by which yeast converts sugar to alcohol follows for the greater part the same pathway whereby our muscles convert glucose to water and carbon dioxide with the liberation of vital heat and work. We know also that this process, which involves the conversion of glucose to pyruvic acid as an intermediate, stops at that point if thiamin is absent. This is true alike for yeast cells, for blood cells and for brain cells and can fairly be presumed to be true of cells in general. There is, therefore, profound reason for the association of thiamin with starch in seeds. It is needed for the metabolism of the starch and since carbohydrate metabolism constitutes a gross part of all cell activity, we can see why thiamin so largely sets the pace of vital processes.

Bearing in mind that thiamin is found everywhere in living things and in their dead remains but is rarely so abundant as to provide a great surplus, let us try to imagine how man evolved. Those of our early progenitors who happened to be situated so that they received a large supply in their food, would tend to develop a high requirement which they could not meet when later they were thrown into less favorable surroundings. Here they would perish. On the other hand, those whose supply was very scanty would thrive less vigorously, reproduce less effectively and compete less successfully. Thus in general the evolutionary process would produce men whose requirements were closely attuned to the available food supply. As far as we can tell this is true of man today, for the course of history has been far too short to modify grossly what Nature implanted in us through the long ages of pre-history.

For a few thousand years, man has been cooking his foods more or less and thus losing some small portion of Nature's thiamin supply. Far greater losses are involved in his relatively recent practice of decorticating his grain and refining plant juices to make white sugar. We thus seem clearly to be violating in modern times a fundamental law of Nature when we purify our foodstuffs so as to eliminate the chemical mechanisms which we need to metabolize the food. A reform is needed, but long standing habits are difficult to alter. In some instances, it is easier and much quicker to restore the lost vitamins to staple foods by the use of synthetics which will not alter the accustomed flavor and appearance. But in doing so we must not lose sight of the fact that there are probably other vitamins of importance which we cannot as yet replace in that way.

Nature still remains an unfathomed source of wisdom. I hope we shall not grow arrogant concerning our petty store of knowledge and turn away from seeking out her further secrets. We have tried to point out some practical lessons which chemistry teaches about our foods, but it will do us good to return in closing to the contemplative mood. We may well pause breathless before the marvelous complexity yet wondrous unity of Nature. Our minds recoil when we endeavor to visualize the vast coincidence of circumstances which must have surrounded the first living cell. Even granting that the parent cell of all the countless cells that have succeeded it was far more primitive than any cell

which we now know, some at least of these complex chemical mechanisms must have preceded it. Can there be for us today a more useful lesson than that of a reverence for the mighty Cosmos that has brought us into being, a respect for its timeless patience and inexhaustible ingenuity? It does not wantonly discard what it has produced but builds ever by adaptation of its earliest concepts. No creature, no cell, is so mean but that its meritorious invention may be passed on to be shared by all life. Something of that same wisdom may yet be infused into man's conscious direction of his own affairs and lead to better days in the realm of human relations.

Since man's kinship to the lower forms of life is so intimate, I find it difficult to avoid the conclusion that human thought, human society, and indeed the spirit of man is of one piece with the entire evolutionary process which began in the mud aeons ago. If so, our future adventures are to be extensions of what has gone before. This thought I have tried to put into verse under the title:

CHEMISTRY OF THE SPIRIT

I hold within my hand a twig of growing tree
And mark with mystery the sculpture of the leaf.
That shape peculiar speaks thy personality
Distinct 'mongst all the plants that share thy chemistry.
Within the germ from which thou sprang there must have stood
The figure of some field marshal of the molecules
Whose mind conceived that pattern ere thy first bud burst.
I contemplate the green stuff of those shining leaves
That seize from out the atmosphere spent gas
Of burning bush and dying man, the breath
Of putrefaction and decay to make
The substance of the stalk that rears thy head to heav'n
And lifts up water ton on ton to feed the dews of night.

We hold within our hands the crude stuff of our human souls
Where mind and matter mix. Half-conscious and half-cosmic are
The forces we observe. Across the ether of the spirit
You send a message to some soul that quickens pulse or flames desire
Unto some action eminently physical and yet
We cannot trace it through its course from lips to brain nor brain to hand.
At kidney, throat and base of brain lie tiny glands
Which rule the conduct of the man, yet are themselves
Impelled by mental imagery, emotions' fire, to send
Through blood stream potent stuffs to do a wizardry.
Can you but stimulate the hormones of high hope
Suppress those of despair and hate, kindle a sense of beauty,
Picture the glories of a growing race, the destiny of man,
You have a part in the creation; you too are very God.

CLINICAL MANIFESTATIONS AND MANAGEMENT OF DISTURBANCES IN WATER METABOLISM[1]

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WATER metabolism, considered in its broadest sense, would include too large a field for satisfactory discussion in the time assigned to me this morning. And even as I limit myself to the problems of water loss alone, I shall have to cover more ground than is compatible with efficient exposition. Although detailed reference to the many workers in this field must be omitted, I shall pause long enough to suggest that the point of view of James Gamble and his beautifully analyzed experiments have contributed more to the integration of our knowledge of this field, more to the introduction of a genuinely scientific attitude, than any other influence.

Hippocrates recorded the familiar picture of severe dehydration in the passage that created the term, "Hippocratic facies": "a sharp nose, hollow eyes, collapsed temples; the ears cold, contracted, and their lobes turned out". Many other physicians have since elaborated this elementary description. But the day is past when medical science is satisfied with a description, when the ultimate in diagnosis is the cataloging of a recurrent pattern. Recognition of such a pattern is now merely a preliminary step to a study of the mechanisms that are producing that pattern. Moreover, a cross section of the component forces is not enough, we must know the direction and velocity of the forces. This introduction of quantitative and dynamic concepts into clinical medicine not only constitutes its chief justification to be classed as a science, but also is responsible for a great part of the practical improvement in the care of the sick.

In order to simplify this discussion, one may state that the body fluids are found in two main divisions: the intracellular and the extracellular. Our understanding of the composition and behavior of intracellular fluids is still inadequate and there are, relatively, so few pertinent facts that I shall pass on at once to the structure and physiology of the extracellular fluids, for therein are contained the facts essential to an understanding of the important components that may participate in dehydration.

The fluids existing outside the cells may be subdivided anatomically into that part which circulates in the various blood vessels and capillaries and that part which is found in the interstitial tissue spaces. The relationship between cell contents and the interstitial fluids that bathe them has been, and is, the subject of extensive research but the laws that govern this relationship are still too obscure to permit the production outside the body of a satisfactory working model. On the other hand, the equilibria existing between the circulating blood and extracellular tissue fluids are governed by familiar laws which can be reproduced in test-tube experiments. Indeed, a simple collodion membrane will duplicate the capillary wall as far as movements of water and sodium chloride are concerned, a substitution

[1] Read before the Session on Nutrition and Diet Therapy, American Dietetic Association, New York, October 23, 1940.

wholly impossible when dealing with the cell wall. Consequently, we may consider the blood and interstitial fluids as a chemical unit. This unity is most apparent when one considers the electrolyte structure of the two fluid groups in relation to their osmotic pressure.

Preservation of a constant osmotic pressure is one of the basic natural laws governing the metabolism of body water. When osmotic variations exceed moderate limits, they provoke a strong physiological effort to restore normal levels. Sodium plays the leading role in determining the osmotic pressure of extracellular fluids. This is due to the fact that most of the base in extracellular fluids is sodium (the small amounts of Ca, Mg, and K are relatively insignificant). No other electrolyte can take its place, a situation which is not seen on the acid side, for chloride and bicarbonate are mutually interchangeable to a large degree without serious physiological consequences. Hence a consideration of the electrolyte structure of blood plasma and interstitial fluids may be carried out in terms of sodium and any mention hereafter of salt or electrolyte structure may be so interpreted.

When I first became interested in this field there were many discussions as to the primary importance of water or salt in the movements of body fluids, but these have long ceased because we recognize now that neither is primary but that sodium constitutes an essential structural component in all extracellular body water. Water and sodium cannot exist independently. When the normal body loses water it hastens to rid itself of sodium; when it loses sodium, water leaves at the same time. It is clear, therefore, that the concentration of sodium is a fundamental physiological constant in both sections of extracellular fluids, *viz.* blood and tissue fluids.

The other physiological constant of significance to this discussion of extracellular fluids deals with the preservation of their volume. Decrease in plasma volume is associated with more serious consequences than similar alterations in the volume of interstitial fluids. This is due to the fact that it is possible to produce peripheral circulatory failure or shock by rapid or extreme dehydration of the plasma. The devastating effects of shock are familiar to all, but chief among them is its inhibition of the protective mechanisms by which disturbances of water and salt metabolism are normally corrected.

We have much to learn about the dynamics of dehydration in regard to the relative participation of the blood plasma and the interstitial fluids. For some time it has been believed that plasma volume is maintained at the expense of interstitial or even also of intracellular water. Recent work with experimental dehydration, however, has shown that in most instances the relative percentage of plasma volume shrinkage is greater than that of the interstitial compartments. We may have to discard the attractive idea that the fluid of the interstitial compartment is sacrificed under stress to defend the plasma volume.

Since a decrease in plasma volume is the most ominous effect of advancing dehydration, any quantitative data giving evidence as to the degree of plasma shrinkage would be most useful. The modern methods for quick appraisal of serum or whole blood specific gravity afford such a technique. Hematocrit and hemoglobin determinations afford

somewhat less accurate information; however, they too may be useful at times, not only in estimating the contemporary status of hemoconcentration, but particularly in gauging the response to therapy. We must always bear in mind that this is inferential evidence, not a direct measurement of volume.

No consideration of the problems evoked by a disturbed water metabolism can fail to pay homage to the kidneys. These organs assume, with amazing efficiency, the role of monitor over the sodium and water content of the body as a whole. By delicately adjusted variations in urinary excretion of water and salt, the body fluids are kept at the required constancy of both volume and osmotic pressure. Sudden and severe strains produced by such factors as exercise, change in external temperature, and variations in fluid and salt intake are safely and promptly adjusted. The concentrating ability of the kidney permits the conservation of water with no embarrassment of necessary elimination; ammonia production and the phosphate mechanism save sodium when such control is required. However, an adequate supply of water is indispensable to normal renal function; without it, excretion ceases; similarly it is possible that a marked depletion of base interferes with the activity of the kidneys. When I spoke of the inhibition of protective mechanisms by the state of shock, I had the renal area foremost in mind. One of the truly serious effects of shock is cessation of renal activity due to decreased blood flow.

Before turning to the clinical section, may I recapitulate briefly. We have seen that the portion of body water which we best understand, is that which is extracellular. Extracellular water is divided into the blood plasma and the interstitial fluids. Except for their protein content these two compartments are, in essence, of identical chemical composition with a constant electrolyte structure of which sodium is the dominating component. Consequently the water content of the body is threatened as seriously by sodium loss as by water loss, in fact even more seriously because the body manufactures water as a part of its normal metabolism whereas sodium must be supplied from the external environment. Unless its functions are impaired, the kidney is alert to ordinary variations in total volume and in sodium concentration and is able to correct them. The volume of the extracellular compartments tends to be constant, but under stress is altered according to laws as yet poorly understood. Rapid or extensive decrease in the volume of the vascular section tends to the production of shock, a very dangerous complication.

A clinical survey of dehydration is best undertaken by a study of the mechanisms that can produce water and sodium deprivation or loss at a rate beyond the individual's capacity for adjustment thereto. Such mechanisms occur in diseases of the gastro-intestinal tract, the kidneys, the skin, and in certain metabolic disorders. Historically, the gastro-intestinal tract deserves first mention and I shall call attention to the work of W. B. O'Shaughnessy, an Englishman, who in 1831 published the results of his investigation of cholera. Over 100 years ago, when chemical methods were crude and physicians were empiricists, O'Shaughnessy's intellectual curiosity pushed him into a study of cholera which solved its chemical pa-

thology. By means of blood and stool analyses, he not only recognized that dehydration is the essential complication of cholera, but also was able to explain the mechanisms that cause it. His conclusions may be quoted in part:

1. The blood has lost a large proportion of its water, 1000 parts of cholera serum having but the average of 850 parts of water, *hemoconcentration.*

2. It has lost also a great proportion of its neutral saline ingredients, *sodium depletion.*

3. Of the free alkali contained in healthy serum, not a particle is present in some cholera cases and barely a trace in others, *acidosis.*

4. Urea exists in the cases where suppression of urine has been a marked symptom, *urea retention due to failure of renal function.*

5. All the salts deficient in the blood, especially the alkali or carbonate of soda, are present in large quantities in the peculiar white dejected matter, *base loss in the voluminous stools.*

O'Shaughnessy therefore demonstrated the existence of dehydration, hemoconcentration, base loss, acidosis and inhibited renal function in cholera, and was quite aware of the fact that all were the result of salt and water loss via the stool. Final proof of the completeness of O'Shaughnessy's understanding is evidenced by his therapeutic suggestions: First, restore the blood to its natural specific gravity (*i.e.* water content); second, restore its deficient saline matters, and the method suggested was "the injection into the veins of tepid water holding a solution of the normal salts of the blood". How different was this rational replacement therapy from the traditional procedures of the general medical community of that day! It is easy to imagine the effect of a large blood-letting (the then current treatment) on a patient with a greatly decreased blood volume due to hemoconcentration, yet those in authority frowned on O'Shaughnessy and continued their blood-letting. In fact, it was nearly three-quarters of a century before wide use of saline infusions began significantly to cut down the death rate in cholera. I hope I have infected you with some of my enthusiasm for this brilliant pioneer in the chemical physiology of disease.

Cholera is the severest example of the strain to which diarrhea subjects the salt and water metabolism, but voluminous stools whenever they occur remove water rapidly to the accompaniment of base loss. Sodium depletion and eventually acidosis due to the preponderance of base over acid in the stool, depend on the severity and duration of the disease process. In the ordinary dysenteries the stools are frequent but of small volume with dehydration rarely a serious complication; however, in paratyphoid B enteritis the stools are often so voluminous as to bring about an urgent need of replacement therapy with salt and water. The routine violent purging of previous days must have greatly accelerated dehydration in many an unlucky sufferer.

Protracted vomiting from any cause not only inhibits the normal ingestion of sodium and water but results at times in extensive loss of both these body constituents. When pyloric obstruction exists, larger quantities of chloride than of sodium are removed and as a consequence chloride depletion and alkalosis are observed. Gastric tetany is one of

the secondary effects of such an alkalosis.

In intestinal obstruction two forces operate to cause salt depletion and dehydration. Vomiting has just been mentioned but it differs in this circumstance from that related to pyloric obstruction, because of its higher loss of sodium due to the inclusion of intestinal contents regurgitated through the pylorus. In addition, the dilated intestinal loops contain large quantities of water and salt which through paralysis of absorption remain statically mobilized in the lumen of the gut. This water and salt is, of course, derived from body fluids and plays an important role in the dehydration which seriously complicates intestinal obstruction. It is certain that part, at least, of the so-called "toxic" manifestations of intestinal obstruction are due to the abnormalities of water and salt metabolism which I have just elaborated.

Gastro-intestinal secretions other than gastric juice contain approximately the same concentration of sodium as does plasma, consequently when these fluids are lost from the body the salt loss is even greater than from an equal amount of whole blood. The dangers of bile or pancreatic drainage or from an enterostomy are obvious, and protection of the electrolyte structure by increased ingestion of sodium is a clear indication. In the dehydration resulting from sodium depletion due to these mechanisms, sodium loss is more significant than water loss and hence sodium chloride tablets by mouth (if tolerated), will re-establish and maintain a normal equilibrium.

Since sweat contains both water and sodium, one would anticipate that excess perspiration would be a strain on the water metabolism. The truth of this suggestion has been made evident from clinical and chemical studies of heat prostration and also by observations during heat therapy. Hemoconcentration, decreased blood volume and salt depletion have been demonstrated in workmen subjected to continued exposure to high temperatures both in industrial plants, such as the steel mills, and in projects carried out in natural heat, such as the Boulder Dam construction. Heat cramps (not to be confused with heat stroke which is due to an entirely different mechanism) result from such dehydration and are promptly relieved by replacement therapy consisting of infusions of normal salt solution. The interdependence of sodium and water is well illustrated by the complete prevention of the phenomena associated with heat cramps, which may be accomplished by the addition of one per cent sodium chloride to drinking water consumed during the work period. Pure water does not supply the electrolyte structure necessary for body fluids and hence is unable to rebuild the body fluids lost by extreme degrees of sweating. After many unpleasant experiences, it has become routine to anticipate the dehydration of heat therapy by coincident parenteral restoration of water and sodium chloride.

The skin can become a threat to body water in still another manner. Severe burns produce in the skin several adverse effects. The most serious of these is the exposure and destruction of the capillary bed resulting in the exudation of serous fluids, often in large quantities. Since these fluids are derived from both extracellular compartments, they contain plasma proteins as well as sodium and

water. If the burned area is deep and extensive, the blood volume is rapidly decreased and renal shut-down soon ensues. The damaged capillaries remain patent and thus render futile the benefits of transfusion and other replacement therapy. Another force in the direction of dehydration and salt loss is the accumulation of edema fluid in the necrotic tissues. Here again the accumulation is at the expense of general body fluids and hastens the rapid, downhill course of the injured individual.

Although the kidney is ordinarily an efficient regulator of water and salt metabolism, the very fact that it can so easily excrete these substances makes it readily available for both active and passive roles in the production of salt depletion and dehydration. I shall enumerate certain of these mechanisms and discuss each in more detail thereafter.

1. First, the kidneys play a passive role in the excretion of electrolytes and water during an acute diabetic crisis.

2. Second, in chronic nephritis, decreased renal function with loss of concentrating ability can cause polyuria and sodium loss.

3. Third, a more active role is seen in Addison's disease where a disturbance in renal control causes loss of sodium in the urine because of insufficiency of the adrenal cortex.

The process of dehydration and salt loss in acute diabetes mellitus can best be clarified by describing the sequence of events which follows the withdrawal of insulin in a severely diabetic patient. There is first a tremendous loss of water and salt in the urine as an accompaniment of the glycosuria. The reason for this water and salt loss is not known, although the relatively large amounts of potassium included indicate that part at least is derived from the cells. As ketosis sets in, a second and independent loss of water and salt is stimulated. Soon thereafter, severe dehydration and base loss is clinically and chemically apparent and shock may appear if the train of events is uninterrupted by therapy. It is historically interesting that Fagge in 1874 suggested the use of intravenous saline solutions in diabetic dehydration, stating that "the hypothesis upon which I acted was essentially similar to that which formed the basis of the like treatment in the cholera." Fagge believed that the coma was due as he put it, "to the drain of the water from the system, caused by the diabetes." This important contribution to an understanding of the dynamics of a diabetic crisis was forgotten for many years, buried under enthusiam for the newly discovered ketosis and its implications.

One of the few symptoms of uremia that can be satisfactorily treated, is dehydration. As the diseased kidney is forced to excrete more and more water, due to its inability to concentrate waste substances, a potent source of fluid loss is established. Sodium also is wasted because polyuria probably tends to interfere with tubular reabsorption. Furthermore, the failure of ammonia production in the kidney removes one of the strongest base protecting mechanisms and consequently conservation of sodium is reduced thereby. If, in addition, the overly-enthusiastic physician, uncontrolled by a well-trained dietitian, has instituted a salt-poor diet, it can readily be seen that dehydration and sodium depletion are inevitable. One of

the common symptoms of uremia is vomiting which accelerates the vicious circle because it reduces the necessary supply of water for maximal renal function. The relief that a uremic patient obtains from the administration of an intravenous salt solution is often spectacular.

Descriptions of extreme degrees of insufficiency of the adrenal cortex from the time of Addison's first comments have suggested the picture of dehydration and shock. In fact Addison, himself, compared the symptoms with those he had seen in cholera. Modern chemical methods have demonstrated hemoconcentration and sodium depletion in human cases and animal experiments have indicated that adrenal cortex probably exerts a controlling influence on sodium excretion by the kidney. As soon as cortical extract is withdrawn from an adrenalectomized dog, his urinary sodium excretion increases rapidly, far out of proportion to water loss, and if no therapy is undertaken death in shock ensues. The adrenal cortex has other functions but its influence on sodium and water metabolism is one of its most important duties. Desoxycorticosterone acetate can assume this control over sodium metabolism, restoring the blood levels to normal and indeed will actually cause edema if given in too large doses and accompanied by oral administration of sodium chloride.

Diabetes insipidus is another example of the production of an abnormal water metabolism by means of modified renal control. The physiological mechanisms are not clear but it is usually associated with pituitary or hypothalamic damage and can, in almost all instances, be controlled by pituitary extracts. The polyuria of diabetes insipidus does not lead to dehydration unless limitation of water intake is imposed.

In addition to the well-defined mechanisms presented in the foregoing discussion, there are, in many clinical conditions, certain general factors that bear on our problem. In severe illness there may be inadequate water ingestion. High fever may cause increased loss of water through the skin and the lungs. Massive hemorrhage from the gastrointestinal tract or lungs, or indeed from any source, obviously requires extensive readjustments of body fluids.

Proper recognition of the inception of a state of dehydration depends almost entirely upon the physician's familiarity with the mechanisms that can cause salt or water loss. By the time dehydration is clinically apparent it has gone further than good medical care should permit, unless the forces at play are entirely uncontrollable. When one anticipates a disturbance in water metabolism he should watch for thirst and oliguria. As the fluid loss progresses, shrinkage of the interstitial fluids is evidenced by loss of subcutaneous tissue turgor and by the sunken eyes and pinched face. Drop in the circulating blood volume results in weakness, tachycardia, and eventually fall in blood pressure. When peripheral circulatory failure finally takes place, one sees the cold clammy skin and pale cyanosis of shock.

When the type of disease existing in an individual suggests dehydration or salt loss as a possible complication, certain objective data should be obtained at regular intervals and during treatment repeated observations will make it possible to be far more accurate in the application of rational therapy. As

stated previously, hemoconcentration may be accurately studied by the easy and modern methods of determining serum or whole blood specific gravity. When this is impossible, hemoglobin and red blood counts may help. Unfortunately hemoconcentration is a manifestation of the latter stages of dehydration and consequently gives no early warning. We must emphasize once more the necessity for appreciating the possibility of dehydration before it is well under way.

It should be apparent by now that the only safe therapeutic approach in this field is preventive medicine. If the patient is losing large quantities of water and salt by stool, extra amounts of these substances must be ingested; if the oral route is unavailable, the parenteral must be used. When a diabetic is under stress and slipping from control, the fluid balance is fully as important as the carbohydrate metabolism or ketosis. The patient who is losing sodium through bile drainage must be given salt tablets. The uremic patient should be given a free hand with the salt shaker unless the presence of considerable edema makes it unwise.

The introduction of salted drinking water into industrial situations involving exposure to excessive heat has not only prevented heat cramps but greatly lessened the fatigue of the workers. When this method of avoiding the hazard of sweat loss was first instituted, rather complicated solutions containing a variety of salts were employed but experience demonstrated that with adequate amounts of sodium chloride and water the kidneys were able to make all the necessary adjustments. This finding is not unexpected in view of the facts that were presented in discussing the monitoring function of kidneys.

When dehydration is definitely established, patients thus affected may, for purposes of therapeutic discussion, be placed in two groups. The differentiation between the two depends upon preservation of the circulating blood volume. We shall consider first those cases which have been able to maintain their blood volume at normal or nearly normal levels, sufficient, at least, to prevent the appearance of shock. Those cases which have no disturbance of the gastro-intestinal tract respond satisfactorily to water and salt by mouth; the latter in enteric-coated pills. The amount of salt to be given depends upon the rate of salt loss and the concentration of sodium in the serum. Prolonged bile drainage offers an example of this group, and there is little difference between prevention and cure here.

The appearance of nausea and vomiting demands more complicated replacement methods. Saline rectal taps are helpful but are often not tolerated; moreover it is difficult to give enough fluid by this route. Consequently, parenteral fluids are usually required for satisfactory results. Clyses are more convenient because they require less watchful supervision but they take longer than infusions and may be more tiring for that reason. However, either technique will accomplish the required fluid and salt replacement *if shock has not appeared.*

A drop in blood volume to shock levels produces a vicious circle that must be interrupted rapidly and directly by the intravenous route. If shock has only recently become a complication, intravenous salt solution in fairly large

amounts is usually successful but when shock has reached a severe phase and capillary damage therefrom has occurred, blood transfusion is a necessary adjunct to replacement of salt and water. When there is hemoconcentration, with advanced shock, infusions of plasma are preferable to whole blood. Under no circumstances should one use clyses in peripheral vascular failure, for poor peripheral circulation prevents subcutaneous absorption.

Many types of salt solution have been offered as the ideal replacement fluid. They have been based usually on the composition of extracellular fluids. There is little evidence that any of these solutions are any better than normal saline. As I have said before, the kidney can adjust the electrolyte pattern without difficulty providing adequate amounts of water and sodium chloride reach the circulation. It is impossible to be precise in the abstract as to the proper amounts of replacement fluid. The need varies with the degree and nature of the dehydration and is further influenced by the individual background of the patient. But one can say: give fluids until the desired results have been obtained, do not use an empiric schedule. Although patients are occasionally water-logged because of too enthusiastic treatment, it is still true that others are undertreated.

One of the most complicated problems of dehydration is seen in the chronic malnourished patient with a low serum protein concentration and general edema because of this defect. Such an individual may be losing sodium from a bile fistula or enterostomy and be suffering from salt depletion and lowered blood volume while the interstitial fluid compartment is swollen with edema. Sodium administration would increase the accumulation of edema; on the other hand, without it, prostration, poor circulation and interference with renal function result. It is necessary to build up the serum protein with blood transfusions or plasma infusions before pushing saline therapy. This is an ideal situation for the use of parenteral amino-acids when or if that approach becomes more practical than at present.

I have endeavored to point out that the recognition, prevention, and treatment of dehydration depend for their effectiveness on an understanding of the various mechanisms by which water and sodium may leave the body in excessive amounts. The gastro-intestinal tract, the skin, and the kidneys offer the main routes under various disease influences.

The well-trained dietitian should be familiar with the facts that I have briefly discussed. If she understands them she will often be in a position to make helpful and practical suggestions to the physician with whom she is working. It is not impossible that her understanding will exceed that of the medical man, surely a delightful position if it is kept under control. But the greatest value derived from a real knowledge of the underlying mechanisms of disease is the pleasure it adds to the practice of your profession. Let your ambition to obtain such knowledge be unbounded.

EFFICIENCY IN MOTION[1]

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IN APPEARING before the American Dietetic Association I am here not as an authority on kitchens, but as an engineer and a representative of industry, wherein the science of motion economy was developed and where today it is applied to its greatest extent. Time is too limited here to describe the history of motion study or the methods commonly used in applying it. Therefore I shall proceed immediately to its application in your particular problems.

Before beginning such a discussion, however, may I pause a moment to emphasize the humanitarian aspect of this work. The very nature of our American economic system makes it necessary for firms to compete with each other on a basis of manufacturing costs, but it is this principle which has forced American industry to lead the world in progress and none of us would have it otherwise. Motion study is one of the tools used by industry in this competition. Industry, too, is growing more and more conscious of its responsibility to the society to which it belongs. Industry knows that the working conditions surrounding employees are the greatest single factor affecting their lives and the lives of their families. It is our belief that with the thorough application of the principles of motion economy, working conditions will be improved and fatigue reduced. Employees so benefited are better employees, more capable of doing their daily tasks and maintaining a high standard of quality in their work.

Dr. R. M. Barnes of the State University of Iowa, in his book, *Motion and Time Study*, enumerates the principles of motion economy in 22 rules which when properly applied can be used as a basis for the constructive criticism of all forms of work. In order to understand these more thoroughly, however, it is necessary to explain the term "therblig" which is derived from the name "Gilbreth" and was adopted by Dr. and Mrs. Gilbreth as a name for an "element" of motion. In the course of their studies they determined that every motion made by human hands can be broken down into its own peculiar combination of 18 elementary motions called "therbligs." Thus the familiar motion of picking up a fountain-pen from a desk and placing it in one's pocket consists of the following combination of "therbligs": (1) transport empty (moving the empty hand to the pen) (2) search (feeling for the pen) (3) find (4) grasp (5) transport loaded (carrying the pen in hand to the pocket (6) position (place the pen in the pocket) (7) assemble (clip the pen to the pocket) (8) release load and (9) transport empty (return hand to normal position).

The very first one of the 22 principles of motion economy states that the two hands should begin as well as complete their therbligs at the same instant; the second, that the two hands should not be idle at the same instant except during rest periods; the third, that motions of the arms should be made in opposite and symmetrical directions. These three

[1] Read before the Session on Problems in Kitchen Management, American Dietetic Association, New York, October 24, 1940.

principles are fundamental and are noticeable in all of the jobs you have. If you keep them continually in mind you will find innumerable applications for them.

The Principles of Motion Economy[1]

USE OF HUMAN BODY

1. The two hands should begin as well as complete their "therbligs" at the same instant.
2. The two hands should not be idle at the same instant except during rest periods.
3. Motions of the arms should be in opposite and symmetrical directions, instead of in the same direction, and should be made simultaneously.
4. Hand motions should be confined to the lowest classifications with which it is possible to perform the work satisfactorily.
5. Momentum should be employed to assist the worker wherever possible.
6. Continuous curved motions are preferable to straight line motions involving sudden and sharp changes in direction.
7. Ballistic movements are faster, easier, and more accurate than restricted or "controlled" movements.
8. Rhythm is essential to the smooth and automatic performance of an operation and the work should be arranged to permit easy and natural rhythm wherever possible.

ARRANGEMENT OF THE WORK PLACE

9. Definite and fixed stations should be provided for all tools and materials.
10. Tools, materials, and controls should be located around the work place and as close in front of the worker as possible.
11. Gravity feed-bins and containers should be used to deliver the materials as close to the point of use as possible.
12. "Drop deliveries" should be used wherever possible.
13. Materials and tools should be located to permit the best sequence of "therbligs."
14. Provisions should be made for adequate conditions for seeing. Good illumination is the first requirement for satisfactory visual perception.
15. The height of the work place and the chair should preferably be so arranged that alternate sitting and standing at work are easily possible.
16. A chair of the proper type and height should be provided for every worker possible.

TOOLS AND EQUIPMENT

17. The hands should be relieved of all work that can be performed more advantageously by the feet or other parts of the body.
18. Two or more tools should be combined wherever possible.
19. Tools and materials should be "pre-positioned" wherever possible.
20. Where each finger performs a specific movement, the load should be distributed in accordance with the inherent capacities of the fingers.
21. Handles on hand tools should be so designed that as much of the hand comes into contact with the handle as possible.
22. Levers, cross-bars, and handwheels should be located in such position that the operator can manipulate them with the least possible change in body position.

The fourth principle states that hand motions should be confined to the lowest classification possible. These classifications are as follows: (1) finger motions; (2) motions involving fingers and wrist;

[1] From *Motion and Time Study* by Ralph M. Barnes, New York: John Wiley & Sons.

(3) motions involving fingers, wrist and forearm; (4) motions involving fingers, wrist, forearm and upper arm; (5) motions involving fingers, wrist, forearm, upper arm and shoulder.

Examples of this principle might be the location of knives in convenient and protected places directly in front or at the side of a meat cook's table or the placing of ingredients for pastry cook or salad maker.

The fifth principle states that momentum should be employed to assist the worker wherever possible. An excellent example here is that of an operator dipping chocolates in a candy factory. He would pick up the piece of candy, dip it and hold it in the syrup and even move it back and forth in the syrup. This was changed to a long, sweeping, ballistic movement with the dip occurring at the end of the stroke but before its completion. Identical results were thereby accomplished in less time and with less fatigue to the operator. For other examples of this principle, watch any person who is used to handling heavy work such as sides of beef and see how he makes the weight of the piece do as much of the work for him as possible by merely pushing or pulling to change the course of the piece while it is moving through the air. Notice also how golfers let the heavy head of the golf club do most of the work in hitting the ball. They do little more than guide the club head in its proper course and see to it that the impact takes place at the point of maximum momentum.

The sixth principle states that continuous curved motions are preferable to straight line motions involving sudden and sharp changes in direction. Note how the nervous type of individual who fusses and bustles about the whole day through actually accomplishes less than others who do not seem to be working nearly so hard. The difference in their fatigue is tremendous. Dr. Barnes has produced in his laboratory a machine known as a "Kymograph" which consists principally of a table over which a sheet of paper is drawn at a constant rate. Various attachments are used over the paper by means of which hand motions may be translated onto the paper in the form of graphs. These graphs are then studied and the slope of the curves formed gives a very accurate measure of relative speeds. With this he has proved, among other things, that the time required to make a continuously curved up and down stroke with the pencil, without trying to start and stop at fixed points, is less than when moving back and forth against physical stops and that, in turn, is less than when moving back and forth between visual stops.

The seventh principle states that ballistic movements are faster, easier, and more accurate than restricted movements. In restricted or controlled movements one group of muscles is working opposite another in order to obtain control. A golf swing is a good example of a ballistic movement. When you press, or attempt to control your stroke by opposing the freedom of the swing with other muscles, you actually lose in accuracy. The blacksmith with his hammer and the butcher with his cleaver are other examples of the same type of movement.

The eighth principle states that rhythm is essential to smooth and automatic performance. This is especially true in repetitive operations, in fact

studies have shown that working performance is enhanced by music. The effect of rhythm is also quite noticeable in ordinary or less repetitive operations. While discussing this particular point with a friend of mine who is a dietitian, she told me a very amusing little story of her own experience. It seems that pastry cooks tend to develop individual styles of rhythm when doing hand mixing. My friend's cook, whom we will call Carl, developed over the years a quite distinctive rhythm. Some of Carl's acquaintances attended a Deanna Durbin picture in which a cook is seen giving lessons in proper mixing methods and there, blaring forth from the screen, came the unmistakable rhythm of their own Carl's beater. They hurried to Carl with the story and although he dislikes motion pictures they made his life miserable until he finally made his way reluctantly to the theater. Five hours later Carl emerged with blinking eyes from the darkness having seen the picture twice. And that was not all—the very next day Carl was at the theater seeing the same show for the third time and this time he brought his wife!

You will note that all 8 principles just described apply to the use of the human body. The second group concern the working place and its arrangement. The first of these or the ninth in our total list states that fixed stations should be provided for all tools and materials—"A place for everything and everything in its place." You all know the advantage of having your pen or pencil in a desk stand, which is an admirable example of this principle. The tool, your pen, is always in its place and in the right position for picking it up. This same principle applies in the location of knives, spoons, mixer paddles, or the ingredients of a recipe.

Number 10 says that tools, materials and controls should be located around the work place and as close in front of the worker as possible. Considerable research has been done which shows the value of having everything the worker uses within as easy reach as possible. How wonderful it would be if your pastry cook could stand in one place and reach all his ingredients, his mixer, and any necessary spoons or other tools without having to take over two steps in any direction. Perhaps a semicircular table would be needed with shelves and bins at convenient locations above and below the table, and the mixer in the middle of the semicircle.

Number 11 says that gravity feed-bins and containers should be placed as close to the point of use as possible. The labor unions, as you know, will not permit their higher class tradesmen to do lower classes of work. A bricklayer is not allowed to carry bricks because cheaper help can be hired to do that work. In factories handlers bring supplies to the workmen and take their finished work away. Perhaps this same general principle is applied by most of you. It could be applied still further with overhead flour or sugar-bins in the old-fashioned kitchen cabinets. Standard bins are obtainable which can be reassembled in practically a limitless number of arrangements and these might have very specific application in a kitchen.

Number 12 says that drop deliveries should be used wherever possible. Minute analysis of slow-motion pictures will convince the most skeptical that it takes considerably less time to drop an

object than to place it. That is why we like to have operators drop their work into chutes wherever possible.

Number 13 says that the materials and the tools should be located to permit the best sequence of "therbligs". In other words, if a man is using a knife to cut meat and lays the knife down to stack the pieces in a tray he should lay the knife down by the meat where it is to be used next rather than by the pan.

Number 14 says that provisions should be made for adequate illumination which is the first requirement for satisfactory visual perception. Any work which requires the use of vision for the placing of parts, arrangement for color, for size, for physical perfection or location, is worthy of some study in an attempt to improve the illumination. This is especially true from the standpoint of eye fatigue. For myself, eye fatigue is one of the most noticeable forms of tiredness and it affects my own reactions to all other forms of effort. With proper illumination you will be sure of using less spoiled food, of more thorough mixing, of improved appearance of food, more tasteful arrangements, as well as greater cleanliness. This is especially true in a salad room, since lettuce and other greens are so difficult to clean.

Number 15 says that the height of the work place and chair should be so arranged as to permit alternate sitting and standing at work. New York State through its Department of Labor has made extensive studies on this, as have many other states, and has printed pamphlets which can be obtained at a small cost, for example, *First Principles of Industrial Posture and Seating*, New York Department of Labor Special Bulletin # 141. It is very difficult to sit or stand all day long. Extensive studies have shown that the average distance from the floor to a female employee's elbow is 40 inches and for male employees, 42 inches. If the worktable is to be 1 to 3 inches below the elbow, the table should be approximately 38 to 39 inches above the floor. It is entirely possible that this height should be lower for kitchen work. At this level, the chair seat should be 25 to 31 inches above the floor, depending upon the individual. There should be 6 to 10 inches of space between the chair seat and the under side of the table. A foot rest, wide enough to support the entire foot and not just enough to hook the heel of a shoe over, should always be provided for employees seated on such high chairs. It should be a part of the table, not the chair, and be 8 to 12 inches wide and at the proper level for the worker. Adjustments can easily be made in the height of foot rests, and floor racks can be provided for the shorter workers who are at tables built for taller people.

Number 16 is very similar to 15 but because of its importance is included separately. A chair of the proper type and height to permit good posture should be provided for every worker possible. So important is this that section 150 of the New York State Labor Law states that "A sufficient number of suitable seats, with backs where practicable, shall be provided and maintained in every factory, mercantile establishment, freight or passenger elevator, hotel and restaurant for female employees who shall be allowed to use the seats to such an extent as may be reasonable for the preservation of their health." Good chairs should be adjustable in height, rigid, have a back rest which preferably is adjustable to the worker and gives proper support to the small of the back

and be small enough not to interfere with arm movements. They should have a saddle of the proper shape and size to give even distribution of body weight and still not interfere with motion.

These first 16 principles are the ones which I believe are most applicable to your work. The last six deal with the tools and equipment used and may be less interesting to you. Even so, I shall point out their possible applications.

Number 17 states that the hands should be relieved of all work which can be performed more advantageously in other ways. In factory work we apply this by providing foot pedals for starting and stopping machines, for operating vises, drill presses and other equipment. We also provide holding fixtures so that the hands do not have to do the work of a vise. Dietitians provide their workers with mixing machines, potato-peeling machines, meat slicers and so on, which relieve the workers to an even greater degree and it is possible that there are other operations which could be relieved by the use of foot pedals or other semi-mechanical devices. Perhaps if some of you feel in an inventive mood you can devise some such fixture for holding a half orange on the fruit-juicer without having to grip it tightly in the hand. I don't know where all the possibilities in the application of this principle lie but I would be surprised indeed if there were not several.

Number 18 states that two or more tools should be combined where possible. The ordinary salad-fork is an old application of this principle in which a knife is combined with a fork as one tool. A perforated spoon is likewise a combination of a strainer and a spoon and it might also be advantageous to sharpen the edge of some spoons so that a little cutting could be done with them. These examples, of course, merely indicate that motion study is not a new idea. While human beings exist someone will always be thinking of ways of doing work with less effort.

Number 19 states that tools and materials should be properly placed wherever possible. The desk set incorporates this principle in that the pen is held in just the right position for immediate use. I once saw a sandwich maker at a quick-lunch counter who had his knife in a slot at the side of his work placed so that when he wanted to use it he merely pushed down and toward himself on the handle as he grasped it and the blade came right up almost in the place where he cut the sandwich. I think he might have improved it further by having the knife in front of the work place so that he could cut the sandwich in the same motion with which he withdrew the knife from its holder but at least it was an improvement over the usual procedure of throwing the knife down just anywhere each time it is used.

Number 20 states that where each finger performs a specific movement, the load should be distributed in accordance with the inherent capacities of the fingers. Typewriting is the best example I can give you in which the keys of the typewriter are more conveniently arranged than the regular order of the alphabet would permit.

Number 21 states that the handles on tools should be so designed that as much of the hand comes in contact with the handle as possible. This can best be illustrated with the screwdriver, which exerts its force through the medium of the friction between the hand and the handle. Since we all know that the

amount of friction present varies in direct proportion to the area of contact it follows that the amount of force obtainable varies directly with the extent of surface contact. Tools that are awkward to use constitute another factor affecting hand fatigue. Knife or spoon handles are probably the first items you will think of and I am thinking of a paring-knife handle which has a formed rest for the index finger at the junction of the blade and handle thus making paring less of a strain on the index finger. I am also told that there is a new "Dover type" egg-beater available with a handle sloping off somewhat from the vertical thus eliminating the awkward horizontal position of the older type.

I have in mind, also, the handles on manually operated meat grinders or mop wringers. Often these handles are broken or wobbly or in other states of bad repair. They should be repaired and kept so, not only for satisfactory work but to avoid pinched fingers and cuts.

Number 22, and last, states that levers, cross-bars and handwheels should be so located that the operator can manipulate them with the least possible change in body position. With regard to starting switches for slicing machine motors, adjusting handles on mixing machines, etc., you can do very little but the original designer could often give more consideration to these matters.

The suggestion that you apply these 22 principles of motion economy in your kitchens, however, is much easier said than done. Most of you are working in kitchens that were built 5 to 50 years ago. You have old equipment, old buildings, limited space and no money with which to equip the perfect kitchen. It is usually difficult to accomplish much with old equipment layouts and it is certain that you cannot revolutionize old kitchens overnight. It is better to attempt a little at a time, but first it might be well to do a little long-range planning.

Do you have a blue-print of your building, preferably an equipment layout which shows where all the equipment is located? If not, I suggest that you draw one or have it drawn. Try to get it reasonably near to scale, letting a half or a quarter-inch equal a foot. Draw the walls, the doors, building columns, and windows, and then place the equipment as it now is. Or better yet, make paper outlines of the equipment and lay these on the drawing as you wish. They may be held in place with common pins. Now, with all of the 22 principles of motion economy in mind, play checkers with your pictures until you have a perfect layout.

When the pastry cook comes in and says her table is broken and ought to be fixed, look it over carefully, and suggest that with her help perhaps you could work up a better table for her. There are very few people who do not like new and different equipment, especially when they have helped design it themselves. So be sure to get the cook's ideas. Tell her you want it to be the best pastry corner in the United States and then proceed to drop suggestions which she perhaps will think are her own and like very much. Keep the ideal picture in mind and be patient. Maybe you can accomplish ten per cent of your objective at first or perhaps only two per cent. But keep at it. Possibly you can make outright suggestions sometimes but remember that the human factor is very important here. The best time-saver or the best safety device in the world is

not worth the time it takes to talk about it if it is not used, and if people do not like things they will not use them. So use tact in putting the new idea across. The easiest way to do this is to give the person using it a part in the planning.

There are some jobs that can be just stopped, turned inside out, given a good shaking and started all over again on an entirely different basis. That is especially true of jobs that are done by ordinary labor, maids, vegetable scrubbers, and the like. Such people are usually working for the money they earn and are not too concerned with the exact methods or equipment used. But do not forget that they are all human and deserve consideration.

The most painless way of accomplishing major changes, however, is merely by the unobtrusive use of an accelerated depreciation of existing equipment. Following these tactics I believe you will find over a period of two years that you have attained a really amazing degree of success in the plan you originally worked out on your drawing.

But there still remains the question of the various workers and their jobs. There is a lot of work for you to do here and you will probably have to work it in with your other work as best you can. However, I would start with the simpler jobs first—the simpler the better for a start. Begin by writing down in detail everything a worker does. Watch him do it and write down the main points as you watch: for example, "peels apple and slices into salad" or "peels pear and slices into salad". Then break it down finer than that, such as "reaches for apple with left hand", "secures apple from basket on floor", "turning apple in left hand peels with knife in right hand" and so on.

Whatever you do, though, do not stand around taking notes about people without telling them what you are doing and do not stand behind a post somewhere and peek or spy on them. Nothing will ruin their confidence in you faster. Tell them plainly and simply that you are writing down a complete description of their job and all other jobs; that perhaps by so doing you will be able to improve the job for them and perhaps not, but at least you expect to have a better appreciation of what they are doing. Above all do not give the impression that you are cutting out some jobs or reducing the force. Let the normal turn-over of labor take care of any combining that may be done later. Remember, one of your main purposes here is the elimination of fatigue.

Now after your description is complete even to timing the various parts of the job, study all the operations separately in relation to every one of the principles of motion economy. You will probably think of at least a dozen possible changes that could be made. Some may sound queer at first but write them down anyway and after you are all through try to reconstruct a new cycle for the job. Make it as nearly perfect as possible—illumination, work place, stool, table, tools, and cycle of motions. Now go over it again, weeding out the parts that are plainly impractical and you ought to end with a complete new description of a rather good job.

Now you see why I suggested taking the simple jobs first. It sounds like quite a bit of detail work for one small job but after you have done 8 or 10 jobs this way you will find that it is not nearly so difficult nor so complicated as it first seemed. After doing it 15 or 20 times you may even find yourself enjoying it.

THE EFFECT OF PARENTERAL INJECTION OF CRYSTALLINE VITAMINS UPON THE CONCENTRATION OF MUSCLE CREATINE IN THE RAT[1]

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NUTRITIONAL muscular dystrophy has been produced in several species of animals by feeding them on unfavorable or vitamin E-free diets (1–9). As in the case of human myopathies, the muscle creatine is lowered and the creatinuria increases as the disease progresses. Administration of vitamin E prevents or cures the condition, restores the muscle creatine to normal and causes a disappearance of the creatinuria (10–12). MacKenzie and McCollum (11) have also published simple criteria as guidance in studying the development of the dystrophy and detecting responses to potent supplements within several days.

Einarson and Ringsted (13), in their monograph on the effects of chronic vitamin E deficiency on the nervous and muscular systems of the rat, report that the posterior columns and pyramidal tracts as well as the anterior horn cells degenerate in vitamin E deficiency. This indicates a close analogy between these symptoms and those of amyotrophic lateral sclerosis in man.

Some recent clinical reports on the effects of vitamins B_6 and E are very interesting. Spies, Beam and Ashe (14) report that pellagrins treated with nicotinic acid who still showed signs of extreme nervousness, insomnia, irritability, abdominal pain, weakness and difficulty in walking, obtained dramatic relief from these symptoms within 4 hours after the administration of 50 mg. synthetic vitamin B_6. Usually within one day strength was greatly increased and one patient who previously could walk only a few steps was able to walk 2 miles without difficulty. Antopol and Schotland (15) injected vitamin B_6 in 6 cases of pseudohypertrophic muscular dystrophy and noted considerable improvement in all cases. Following the publication of the monograph of Einarson and Ringsted (13), Bicknell (16) reported remarkable improvement in 2 cases of amyotrophic lateral sclerosis and in 13 out of 14 cases of muscular dystrophy after the ingestion of one-half ounce of fresh wheat germ twice daily. Wechsler (17), using wheat germ oil, also obtained striking improvement in 2 cases of amyotrophic lateral sclerosis.

Much data obtained in our laboratory have shown that there is a close relation between protein, amino-acid and water metabolism, and that of creatine and creatinine. Some of the endocrines also exert a controlling effect on the metabolism of creatine and creatinine. Some time ago we began a systematic investigation of the relationship existing between the vitamins and creatine and creatinine metabolism. In this paper the effect of parenteral injection of some of the different crystalline vitamins on the creatine content of the muscles of normal animals will be reported.

METHODS

Young rats of about 100–150 gm. body weight were fed on our stock diet ($\frac{2}{3}$ whole wheat flour, $\frac{1}{3}$ whole milk

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powder, together with 1 per cent of the weight of the wheat, each, as NaCl and $CaCO_3$) since weaning. Different amounts of the crystalline preparations were dissolved, or as in the case of riboflavin, dispersed in 1 cc. water and injected parenterally into these animals and at 1- to 3-day intervals they were killed and the muscle creatine determined, using the method of Rose, Helmer and Chanutin (18). The Fisher electrophotometer was used for matching the colors. None of the crystalline vitamins, with the exception of "cebione," gave the Jaffe reaction with alkaline picrate.

RESULTS AND DISCUSSION

The results obtained are listed in table 1. Beard, Espenan and Pizzolato (19) have shown that the injection of 1 cc. water into the rat does not change the concentration of muscle creatine but does cause an increased excretion of 25–35 mg. creatine in the urine. The average value of muscle creatine in 552 control rats in 12 previous studies was 0.42 per cent, or exactly that found in the 36 control animals used in the present study.

Thiamin Chloride, Cocarboxylase, Riboflavin and 2-Methyl Naphthoquinone. An increase of 12 per cent in muscle creatine was obtained after injecting 10 mg. thiamin chloride. But the injection of 20 to 40 mg. for 1 to 3 days gave no increase and we therefore attach no significance to the earlier result. Likewise cocarboxylase and 2-methyl naphthoquinone gave no increase in muscle creatine. Riboflavin gave no increase until as much as 20 mg. per day for 3 days had been injected, when the increase amounted to about 16 per cent. In view of the fact that this dose was a massive one, we are not inclined to believe that riboflavin in moderate amounts influences muscle creatine.

Ascorbic Acid. Injection of 10 mg. ascorbic acid for 1 day caused an increase of 26 per cent in muscle creatine but this increase disappeared in succeeding days. Since ascorbic acid, itself, gives the Jaffe reaction, it is not certain that this increase was due to creatine. It will be necessary to test these muscle filtrates with the creatinine enzyme before this point can be decided. Until this is done the relationship of vitamin C to creatine formation remains unestablished.

Nicotinic Acid and Nicotinamide. The injection of 10 and 20 mg. nicotinic acid for 1 day resulted in increases of 19 and 26 per cent, respectively, in muscle creatine. At the end of the second and third days these increases had disappeared. Injection of the same doses of nicotinamide, however, effected no increases in muscle creatine. It is possible that an excess of the amide is not utilized in creatine formation while an excess of the acid is. Both nicotinic acid and vitamin B_6 (pyridoxin) reported below, may aid in the production of those respiratory enzymes containing the pyridine structure which is involved in muscle metabolism.

Pyridoxin and α-Tocopherol. Single injections of 10 and 20 mg. vitamin B_6 (pyridoxin) gave no increase in muscle creatine. But the injection of 20 mg. daily for 3 days or 30 or 40 mg. for 1 day caused an increase of 21 to 35 per cent. In contrast to the results with the other vitamins, the creatine content remains high. Injection of α-tocopherol in doses of 10 to 50 mg. gave no increase in muscle creatine in 1 to 3 days after injection. However, the injection of 100

TABLE 1

Effect of parenteral injection of crystalline vitamins upon the concentration of muscle creatine in the rat

VITAMIN	AMOUNT INJECTED	TIME	RATS	MUSCLE CREATINE			INCREASE OVER CONTROLS
				Max.	Min.	Av.	
	mg.	*days*	*No.*	%	%	%	%
Control			36	0.45	0.39	0.42	
B_1 HCl	10	1	3	0.48	0.46	0.47	12.0
B_1 HCl	20	2	3	0.44	0.40	0.42	None**
B_1 HCl	30	1	3	0.45	0.41	0.43	None
B_1 HCl	40	1	3	0.48	0.44	0.45	None
B_1 HCl	20*	3	5	0.47	0.40	0.43	None
B_2	10	1	3	0.48	0.46	0.47	12.0
B_2	20	2	3	0.47	0.40	0.44	None
B_2	30	1	3	0.47	0.40	0.43	None
B_2	40	1	3	0.48	0.44	0.45	None
B_2	20*	3	5	0.50	0.47	0.49	16.6
B_1 Pyrophosphate	10	1	3	0.45	0.39	0.42	None
B_1 Pyrophosphate	20	1	3	0.44	0.41	0.43	None
B_1 Pyrophosphate	20*	3	5	0.46	0.35	0.41	None
B_1 Pyrophosphate	60	3	5	0.46	0.39	0.42	None
B_6 HCl	10	1	3	0.50	0.44	0.46	9.5
B_6 HCl	20	2	3	0.43	0.36	0.40	None
B_6 HCl	30	1	3	0.51	0.47	0.49	16.6
B_6 HCl	40	1	3	0.52	0.50	0.51	21.4
B_6 HCl	20*	3	5	0.62	0.53	0.57	35.7
B_6 HCl	30	1	6	0.62	0.50	0.56	33.3
Nicotinic Acid	10	1	3	0.52	0.49	0.50	19.1
Nicotinic Acid	20	2	3	0.42	0.40	0.41	None
Nicotinic Acid	20	1	3	0.57	0.49	0.53	26.2
Nicotinic Acid	20*	3	5	0.46	0.40	0.43	None
Nicotinamide	10	1	5	0.43	0.41	0.42	None
Nicotinamide	20	1	3	0.44	0.42	0.43	None
Nicotinamide	30	1	3	0.45	0.41	0.43	None
Nicotinamide	40	1	3	0.41	0.41	0.41	None
Vit. C Ascorbic Acid	10	1	3	0.52	0.49	0.50	26.2
Vit. C Ascorbic Acid	20	2	3	0.42	0.38	0.40	None
Vit. C Ascorbic Acid	20*	3	5	0.40	0.39	0.39	None
Vitamin E	10	1	3	0.50	0.46	0.49	16.6
Vitamin E	20	2	3	0.44	0.41	0.42	None
Vitamin E	20*	3	5	0.45	0.42	0.43	None
Vitamin E	50	1	3	0.44	0.39	0.42	None
Vitamin E	100	1	2	0.54	0.54	0.54	28.6
Vitamin E***	100	2	5	0.55	0.48	0.51	21.4
Methyl Naphthoquinone	10	1	3	0.48	0.46	0.47	12.0
Methyl Naphthoquinone	20	2	3	0.46	0.43	0.44	None
Methyl Naphthoquinone	20*	3	5	0.44	0.39	0.41	None

* 20 mg. daily for 3 days. All of the other doses were injected at one time, *i.e.* on the first day of the experiment. At the end of 1 to 3 days later the animals were killed and the muscle creatine determined.

** Less than 10%, or insignificant.

*** 200 mg. vitamin E gave identical results obtained in these studies as 100 mg.

mg. for 1 and 2 days caused increases of 21 to 29 per cent in muscle creatine. Of interest in this connection is Verzár's (12) statement that it required 200 mg. α-tocopherol daily to suppress the creatinuria in his animals. It is also possible that this oily solution is not so well utilized in creatine formation as is a water solution of a creatine precursor. It is certain, however, that nicotinic acid and vitamins B_6 and E must be considered as necessary for normal muscle metabolism and that one of their functions is to increase the creatine content of the muscle tissue.

The effect of the parenteral injections of the above vitamins on creatine and creatinine excretion will be reported later.

SUMMARY AND CONCLUSIONS

The effect of parenteral injections of different doses of several crystalline vitamins upon the concentration of muscle creatine was studied in normal young rats, and the following results obtained:

1. Injection of vitamin B_1, vitamin B_1 pyrophosphate (cocarboxylase), nicotinamide, and 2-methyl naphthoquinone gave little or no increase in the creatine content of muscles. Ascorbic acid gave an increase of 26 per cent, which, however, may be due to the fact that this vitamin gives the Jaffe reaction.

2. Injections of vitamin B_6 (pyridoxin-HCl), nicotinic acid, and vitamin E (α-tocopherol) gave increases of 20 to 36 per cent in muscle creatine and the possible significance of these results is briefly discussed.

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THE MINERAL CONTENT OF BREAD. II. PHOSPHORUS CONTENT AND CA:P RATIO OF WHITE BREAD[1]

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RECENT analyses of the calcium content of white bread by Prouty and Cathcart (1) showed that the average percentage of calcium of modern commercial white bread is about three times that reported by previous investigators. Thus it was deemed advisable to determine the phosphorus contents of the same loaves used for the calcium analyses in order to ascertain the present quantity of phosphorus and the true picture of the Ca:P ratio in commercially produced bread from various parts of the United States and control loaves to which various quantities of milk solids had been added.

The per cent phosphorus in water bread has been reported by Waller (2) as 0.093 per cent, Bauer and Aub (3) as 0.082 per cent, and Rose (4) as 0.091 per cent. The phosphorus content of bread (ingredients not specified) was reported by Rose (4) as 0.091 per cent, Sherman (5) and Bridges (6), 0.097 per cent, and Feine and Blumenthal (7), 0.093 per cent. Sullivan and Howe (8) and Rose (9) reported the phosphorus content of bread made with milk as 0.087 and 0.098 per cent respectively. Shrader (10) reported the phosphorus content of bread containing 12 per cent dried skim milk as 0.113 per cent. All these results show that there is little variation in the phosphorus content of the different types of white bread.

Fairbanks (11) pointed out that the addition of milk solids to bread increases its nutritive value. Morison and coworkers (12) have reported the phosphorus and calcium contents of experimental loaves containing various amounts of dry whole milk. Morison's data show that the calcium content of bread increases more rapidly than the phosphorus content as the quantity of dry whole milk in the formula is increased.

EXPERIMENTAL METHOD

Ashing. Since many investigators have recommended dry ashing methods for phosphorus, this method was first tried. Several samples of bread were ashed in porcelain crucibles according to the official method of the A. O. A. C. (13). Known quantities of phosphorus in the form of recrystallized sodium dihydrogen phosphate were added to half of these samples. The added phosphorus was not recovered quantitatively, either when determined as magnesium ammonium phosphate (14, 15) or colorimetrically (described below). This indicates the loss of phosphorus during ashing.

Thus, the wet ashing method of Smith (16) was used which gave quantitative recovery of phosphorus when sodium dihydrogen phosphate was added to bread crumb before ashing. Although the wet ashing procedure checked the dry ashing procedure on bread alone (on the few samples tried), the wet ashing method was adopted because it gave

[1] Received for publication January 2, 1941. Part I of this series appeared as "The Calcium Content of White Bread" by Prouty and Cathcart (1).

quantitative recovery of added phosphate. It is undoubtedly better to rely on the wet ashing method, since the phosphorus in bread may exist in various forms, some of which may volatilize during ashing or form compounds which are relatively insoluble.

Phosphorus. Phosphorus was determined by the Truog and Meyer (17) modification of Deniges' colorimetric method, after the wet ashed samples were diluted to an approximate concentration of 0.00025 mg. phosphorus per ml. The standard solution was checked gravimetrically. Dilutions were such that iron, aluminum, manganese, arsenic, etc., did not interfere. This was further verified by the fact that the results obtained by the gravimetric method checked those from the colorimetric method. Blanks were run on all reagents.

TABLE 1

Calcium and phosphorus contents of white breads made with various amounts of dry skim milk (DSM) and dry whole milk (DWM); 0.25% Arkady (yeast food) was used in each dough

SAMPLE NO.	PER CENT MILK BASED ON FLOUR AS 100%	TYPE OF MILK	PER CENT CALCIUM 38% MOISTURE BASIS*	PER CENT PHOSPHORUS 38% MOISTURE BASIS	$\frac{Ca}{P}$ RATIO
5	0	—	0.025	0.068	0.38
6	2	DSM	0.039	0.079	0.49
7	4	DSM	0.052	0.088	0.59
8	6	DSM	0.063	0.094	0.67
9	8	DSM	0.081	0.099	0.82
10	10	DSM	0.097	0.105	0.92
11	2	DWM	0.041	0.076	0.54
12	4	DWM	0.042	0.070	0.60
13	6	DWM	0.047	0.085	0.55
14	8	DWM	0.060	0.094	0.64
15	10	DWM	0.074	0.104	0.71

* Prouty and Cathcart (1).

RESULTS

The per cent phosphorus in the loaves containing 0, 2, 4, 6, 8 and 10 per cent dry skim milk and in those containing 2, 4, 6, 8 and 10 per cent dry whole milk are given in table 1. The per cent calcium, previously reported for the respective loaves (1), was included in order to show the source of the Ca:P ratio as reported.

The phosphorus contents of commercial white breads (37 loaves from 26 states) are reported in table 2. The per cent calcium (1) is included. The results are given on each loaf so that the effects of the per cent and kind of milk and yeast food on the phosphorus and calcium contents are apparent. Samples 1, 2 and 17 were not available for phosphorus determinations and sample 2C was not received until after the calcium work was published.

DISCUSSION

Phosphorus. As with calcium, the phosphorus content increases as the amount of milk increases (table 1) but not proportionally to that of calcium. Dry skim milk when used on the same percentage basis as dry whole milk, in general gives higher phosphorus values. As was the case with calcium, the per cent phosphorus was slightly out of line in some samples. This discrepancy is undoubtedly due to the fact that the bread samples were made on a small commercial scale (10 lb. flour to batch) and the ingredients were weighed in pounds and ounces. Thus errors could be introduced.

The phosphorus results for dry whole milk (table 1) are lower than respective results reported by Morison (12). Morison's results for bread without any milk

TABLE 2

Calcium and phosphorus contents of commercial white bread as sold on the open market in the United States

SAMPLE NO.	STATE FROM WHICH REC'D	PER CENT MILK BASED ON FLOUR 100%	TYPE OF MILK*	PER CENT YEAST FOOD BASED ON FLOUR 100%†	PER CENT CALCIUM 38% MOISTURE BASIS‡	PER CENT PHOSPHORUS 38% MOISTURE BASIS	RATIO $\frac{Ca}{P}$
29	Tenn.	2	DSM	0.45F	0.065	0.096	0.68
23	Tenn.	3	DSM	0.50	0.071	0.114	0.62
41	Ala.	3	DSM	0.45A	0.061	0.084	0.73
22	Tenn.	3.5	DSM	0.50	0.072	0.106	0.68
20	Neb.	4	DSM	0.50	0.067	0.108	0.62
46	Iowa	4	DSM	0.20M 0.40A	0.093	0.079	1.18
50	Wash.	4	DSM	0.33A	0.049	0.088	0.56
37	Ill.	5	DSM	0.50	0.067	0.079	0.85
38	Mo.	5	DSM	0.50R	0.066	0.101	0.65
53	Mont.	5	DSM	0.25F 0.125A	0.089	0.122	0.73
54	Mo.	5	DSM	0.50R	0.081	0.090	0.90
31	Mass.	6	DSM	0.50A	0.077	0.088	0.88
32	Ill.	6	DSM	0.33E	0.094	0.108	0.87
34	Utah	6	DSM	0.30	0.079	0.093	0.85
48	Miss.	6	DSM	0.15M 0.38	0.109	0.116	0.94
24	Md.	10	DSM	0.33	0.137	0.123	1.11
40	N. Y.	10	DSM	0.50	0.145	0.134	1.08
28	Cal.	7	DWM	0.25A	0.083	0.095	0.87
27	Ohio	4.25	SCM	0.42A	0.055	0.084	0.65
25	Cal.	15	SCM	0.37	0.055	0.089	0.62
36	R. I.	8	CM	0.27	0.051	0.076	0.67
26	Fla.	9	CM	0.48	0.070	0.091	0.77
42	Kan.	11.7	CM	0.23	0.059	0.080	0.74
33	Wash., D. C.	10.0	SCSM	0.42A	0.053	0.078	0.68
39	N. Y.	13.4	SCSM	0.57	0.118	0.105	1.12
43	La.	5	PM	0.45A	0.085	0.090	0.94
44	La.	5	PM	0.45A	0.085	0.089	0.96
45	La.	5	PM	0.45A	0.095	0.092	1.03
49	Va.	4 5	PM DSM	0.42F 0.33A 0.20M	0.114	0.124	0.92
16	Ill.	—§	—	—	0.095	0.097	0.98
21	Minn.	—	—	—	0.051	0.098	0.52
30	Maine	—	—	—	0.066	0.089	0.74
35	Colo.	—	—	—	0.090	0.109	0.83
47	S. C.	—	—	—	0.096	0.112	0.86
51	Wash.	—	—	—	0.057	0.087	0.66
52	Pa.	—	—	—	0.087	0.122	0.71
1	Ill.	—	—	—	0.048		
2	Ill.	—	—	—	0.067		
17	Ill.	—	—	—	0.088		
2C	Ill.	—	—	—		0.092	
Averages					0.080	0.098	0.81

* DSM represents dry skim milk; DWM represents dry whole milk; SCM represents sweetened condensed milk; CM represents condensed milk; SCSM represents sweetened condensed skim milk; PM represents powdered milk (further details on this sample were not obtained from the baker).

† A represents Arkady; F represents Fermaloid; E represents Ezyup; R represents Red Star; M represents Mycoban. Yeast food in other samples not reported by the baker.

‡ Prouty and Cathcart (1).

§ Kind and type of milk and yeast food not reported by baker.

are also higher than those given in table 1. Although the phosphorus results in table 1 for bread not containing milk are lower than those of other investigators, the results for bread containing milk agree very well with those of Sullivan and Howe (8) and Shrader (10). These authors gave the amount and kind of milk used, which makes a true comparison possible. In view of this latter correlation it seems that all previous values of phosphorus content for bread not containing milk are high.

As shown in table 2, the average per cent phosphorus of 37 loaves from 26 states was 0.098 per cent on a 38 per cent moisture basis (maximum moisture found in bread). The highest result was 0.134 per cent; the lowest, 0.076 per cent. The average phosphorus content of the commercial loaves (containing milk) agrees well with values of other investigators for bread containing milk. Thus it again appears that the values of other investigators for water bread are high.

The results reported in this paper show that the percentage of milk is not necessarily an indication of the per cent phosphorus (or calcium) in commercial white bread. In some cases the phosphorus content is higher than would be indicated by milk content alone. This is undoubtedly due to the various types and percentages of yeast foods used and to the fact that some yeast foods contain relatively high quantities of phosphates, while others do not contain any.

The human adult needs on the average a minimum of 0.88 gm. phosphorus per day (5). If a person consumes 6 (approximately 1 oz.) slices of average white bread per day, on the basis of the results obtained in this paper he will receive 0.167 gm. phosphorus per day from bread. This would be 19 per cent of his total minimum phosphorus needs for that day, providing all this phosphorus is assimilable.

Ca:P Ratio. Although consideration of the Ca:P ratio may not be of great importance in discussing calcium and phosphorus requirements, it is important within certain limits. Present-day knowledge indicates that the Ca:P ratio in the human diet should be between 1 and 2 during rapid growth, and perhaps somewhat lower for adult maintenance. Of course, it is realized that the optimal Ca:P ratio is influenced by the vitamin D intake and other factors.

The effect of milk solids on the ratio is pointed out in table 1. As the per cent of milk in the bread is increased, the Ca:P ratio also increases; the ratio for 8 per cent dry skim milk being more than double that for water bread. Thus the addition of milk to bread adjusts the Ca:P ratio to a much more desirable figure.

The average Ca:P ratio of all the commercial loaves reported in table 2 is 0.81; the lowest, 0.52; the highest, 1.17. It is apparent from table 2 that the kind and amount of yeast food, as well as the kind and amount of milk, exerts a marked influence on the Ca:P ratio in commercial bread. Thus it is apparent that the Ca:P ratio of the commercial white bread of today is nearer the optimal figure than bread of the past, when only flour, water, yeast and salt were used in bread making. It is interesting to note that the Ca:P ratio of commercial white bread (0.81) is far superior to that of the white flour from which it is made, that is, 0.15 according to Sherman (5).

SUMMARY

A series of loaves containing 0, 2, 4, 6, 8 and 10 per cent dry whole milk and another series containing 2, 4, 6, 8 and 10 per cent dry skim milk were analyzed for phosphorus. Thirty-seven of the most popular commercial white loaves from 26 states were also analyzed for phosphorus. All of these loaves were analyzed for calcium by Prouty and Cathcart (1), thus the Ca:P ratios have been calculated.

As the percentage of milk solids was increased, the percentage of phosphorus increased. The average percentage phosphorus found in the commercial loaves was 0.098 per cent. The separate phosphorus values for the commercial loaves did not show as great a variation as the calcium values. The various percentages and kinds of milks and yeast foods used exerted less influence on the phosphorus than on the calcium content.

Six slices of average commercial white bread per day will supply approximately 19 per cent of the total minimal phosphorus requirement of the normal adult, assuming all the phosphorus is assimilable. Unlike calcium, phosphorus is abundant in most common foods and is rarely, if ever, deficient in the average diet in this country.

The average Ca:P ratio of the commercial white bread analyzed was 0.81. This ratio is nearer the optimum desired for the adult human than analyses of calcium and phosphorus reported by previous investigators would indicate. The use of milk and yeast foods in bread today has doubled the ratio of Ca:P over that of bread made without these ingredients.

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EDITORIAL

"ARE WE WELL FED?"[1]

It takes a national emergency to jolt people into an acute awareness of life's essentials, to blow the chaff out of our thinking and bestir us to a lively interest in national problems as these affect our well-being and safety. Wars and rumors of wars are not always entirely calamitous in their effect. Out of the last war arose a deep concern for our physical fitness, an awareness of the need of attention to the causes of subnormal physique, along with discoveries that served to advance medical knowledge.

With the present emergency has come a reawakening, motivated by the nation's urgent need to be strong and alert. And "strong and alert people are built by abundant and well-balanced diets." Thus reads an opening sentence in *Are We Well Fed?*, a summarized report of studies of family food consumption made by the Division of Family Economics of the Bureau of Home Economics.

It is becoming almost trite to say to physicians and dietitians that nutritional diseases constitute our greatest medical problem, yet repetition may be needed to arouse professional people to action and instil in others the importance of the problem. In terse, graphic paragraphs and striking pictograms, the report in question brings home to all the import of good nutrition in strengthening the defenses of the country. The more tangible means of defense may be attained—the thousands of planes, the battleships, the millions of man power—but the will and the urge to defense is contingent upon the strength and well-being of the people. It is an old story, too, to dietitians, that the state of nutrition directly affects normal growth and development, natural resistance to infection, and what is so woefully needed now, efficiency on the job, whether it be learning or doing. Only with a state of good nutrition comes that sense of well-being, that joy in being alive, that zest in being able to work, and finally, to defend what we hold dear.

What is the factual situation in the United States? Only about one-fourth of our families subsist on diets that could be rated "good"; more than a third, on diets that might be considered "fair"; while another third or more subsist on diets that should be classed as "poor." "Good" diets exceed the minimum standard by at least a 50 per cent margin but by less than 100 per cent in the case of vitamins; "fair" meet the minimum standard in all respects but exceed it by less than a 50 per cent margin; and "poor" diets fail to meet the minimum standard in one or more respects. Elsewhere in this issue is the report of a study of over 700 individuals in a large western city, which details how deficient a "poor" diet may be and how helpless is the plight of some relief families, powerless to lift themselves out of the quicksands of malnutrition.

[1] A Report on the Diets of Families in the United States, by Hazel K. Stiebeling, Senior Food Economist, Family Economics Division, Bureau of Home Economics, U. S. Department of Agriculture. For sale by the Superintendent of Documents, Washington, D. C. Price 15 cents.

It is a problem of economics, but fully as much it is a problem of education. And the situation as it exists in the United States should serve as a clarion call to all dietitians and nutritionists. There is a "grim necessity for the nation-wide nutrition drive, as part of our defense program." The milder degrees of nutritional deficiency wreck courage, undermine the will to do, interfere with sleep, and depress resistance to disease. As the late Mary Swartz Rose only last year remarked: "Malnutrition is like an iceberg; its greatest mass and its greatest danger lie beneath the surface." These milder degrees of malnutrition, as expressed recently by Dr. Russell M. Wilder, account for much of the shiftlessness of the poor whites of the South, and for a considerable part of the relief roll. The undernourished are unable to hold jobs if they find them; they become unemployable.

Truly, "We have a job to do. You and I, and everyone." Poor food habits must give way to the practice of the newer knowledge of nutrition throughout the length and breadth of the land. Families must be taught how to get the well-rounded and varied meals they need for what they can spend in money, time and energy. Dietitians and nutritionists today have not only the greatest opportunity in the history of their profession but also a great social obligation.

MEETING THE PRESENT SHORTAGE OF DIETITIANS

The current shortage of dietitians necessitates a reversal of the attitudes born of the depression. Not long ago we were combating a shortage of openings for dietitians by trying to create new positions at least as fast as old ones disappeared. Now, however, we must reverse our efforts and try to provide enough dietitians to meet the demand. In a profession which had no available surplus of personnel, the Army's call for several hundred people creates a real problem, and we must find ways not only of increasing the supply of dietitians but of economizing in the use of those we have.

If we are to meet the demand by increasing the number of dietitians, obviously we shall not be willing to sacrifice quality to quantity by lowering standards. The approved courses for student dietitians can increase their enrollment only to the extent of their facilities and of the supply of satisfactory applicants, and to increase the number of graduates equipped for such appointments takes several years of planning in colleges of home economics. Then, too, expansion must not exceed the probabilities of the demand after the present emergency is over.

Another small increase in the number of available dietitians can be made by encouraging those who have married and are inactive professionally to return to work in the communities where they have established their homes, thus releasing single women to the Army. In order to make it possible for them to do justice to their home obligations, hospitals may find it necessary to adjust working hours, offering a straight shift rather than a divided shift, or permitting two such people to share a job, each on a half-time basis. The dietitians who come back to the field, es-

pecially if they have been out for some time, must expect to spend time and effort in learning of new developments. Whether this is to be done by a quarter's work or a summer session at a college of home economics, or whether hospitals will offer special experience of this sort, is a question for discussion. Certainly the people involved should start immediately preparing to meet this need which is already urgent. Professionally trained women can help most in the defense program by working in their own field.

Economy in the use of dietitians may sound like retrogression, as though some of the ground gained in the past two decades were to be relinquished. Actually, it can be just the reverse. A critical survey of almost any large dietary department will prove that dietitians are doing work which could be done by less highly trained workers. A revision of schedules, with sufficient nonprofessional workers for the jobs which they can do and which are too often done by the dietitian, will actually improve her status and increase her satisfaction in her job. We shall then in reality be executives, teachers, and directors of nutrition and diet therapy. We need not give up control of our departments at any point. No dietitian would feel that she had been deprived of any essential responsibility if she had sufficient clerical help to relieve her of jobs such as answering the telephone and transmitting to the proper workers such information as admission and discharge of patients, and orders for food to be sent to the wards; inventories and routine food ordering; figuring costs, handling orders and invoices; typing, filing, recording census; checking time books and computing payrolls; checking food trucks and in some cases routine trays; and general running of errands. None of these jobs need be done by a dietitian. It does not take five years of professional training to take an order from the fifth floor for six baked potatoes and to tell the cook to add them to the supply; to take Mrs. Jones' card out of the file when she goes home; to determine that there are now ten cases of eggs in the refrigerator; nor to take an order book upstairs to the superintendent's office. These routine tasks add nothing to the dietitian's satisfaction in her job nor to her control of her department. In commercial food service, a head waitress supervises the dining room, yet in a hospital this, too, is often one of the dietitian's duties. Regrettably, one even finds her helping out where maids are insufficiently supplied! In industry, the use of highly skilled workers for less skilled work is recognized as wastefully stupid management, but in hospitals this has not been considered carefully enough.

In any large dietary department, as members of the staff leave and replacement becomes difficult, a careful analysis should be made to determine whether by redistribution of work a nonprofessional person can be used to fill at least one position. If this were done in every department where practical, pressure might be relieved and dietitians themselves would greatly benefit by using their full capacities.

CURRENT COMMENT

THE ST. LOUIS MEETING

ELEANORA SENSE

Twenty-four years ago a group of dietitians organized the American Dietetic Association. Dietitians serving overseas and in Army hospitals during the first World War believed in the importance of having a dietitians' association. Ever since then, dietitians from all over the country have convened annually, the number increasing from a few hundred to a few thousand.

This year at the annual meeting in St. Louis, dietitians in attendance will learn first hand of the importance of their organization, the American Dietetic Association, in the national defense program. Nutrition is headline news these days. During the short life-span of the American Dietetic Association, public interest in nutrition has raised this subject from the commonplace to a ranking position in the defense program.

The committees in St. Louis are planning an informative program keyed to the times. That this will be one of the best and most important programs is a mild prediction after perusing the tentative outline of the program chairman, Marie Harrington.

A dietitian's job is to plan appetizing, nutritious menus, therefore on her travels she is on the alert for new ideas on food. With this in mind, Ruth Kahn, convention chairman, is sleuthing through historical books which will assist her in planning meals that are typical of St. Louis and its environs. Do you know that the French influence permeated the cookery of old St. Louis? Do you seek some Missouri country-cured ham with all the "fixings" or that corn-fed fried chicken for which the Middle West is justly famed? Then come to St. Louis in October.

Attendance at these annual meetings gives one a new perspective, renewed enthusiasm, and a wealth of information. St. Louis, as a convention city, has much to offer. Visitors will have an opportunity to see "Ol' Man River", to see parks and zoos that house two of the country's living pandas, to see architects' dreams making St. Louis truly a city of homes, to see university, municipal and industrial buildings which make the new St. Louis a rich, modern metropolis, the capital of commerce and industry in the Middle West.

Have you marked the dates on your calendar? October 20–23, 1941, and the Hotel Jefferson is convention headquarters. Plan to attend, for the American Dietetic Association requests your presence at a most important annual meeting. Hear first hand reports of the role dietitians are taking in the total defense program. Keep up with the findings of nutritional research as presented by the leading scientists of the country. And above all meet with your dietitian friends of old and make new friends. Come to St. Louis on October 20 and stay the entire week.

HOW ADEQUATE IS THE RELIEF DIET?[1]

PAULINE DILL SWANSON

In order to determine how many families on general relief in Denver are

[1] The diet evaluations for this report were made by the Department of Dietetics of the University of Colorado School of Medicine and Hospitals. Mrs. Swanson, chief dietitian, supervised the study which was done by three student dietitians, Margaret Culp, Iladelle Holtslander, and Helena Booher.

adequately nourished, a nutritional study of each individual case was made. Menus for two days and the amounts of milk used in two weeks were obtained from each individual during a personal interview, and the amounts of each food recorded. For example, the following typical menus were reported by a single man for the two days preceding the interview. One can of evaporated milk was used per week.

Breakfasts

1 cup oatmeal
2 tsp. sugar
⅛ cup evaporated milk
Coffee

Dinners

1 cup baked beans
¾ cup boiled potatoes
6 prunes

2 slices veal loaf
¾ cup fried potatoes
4 slices bread
1 tsp. oleo
6 prunes

Suppers

1 cup corn meal mush
2 tsp. sugar
⅛ cup evaporated milk
4 slices bread
1 tbsp. oleo
Coffee

1 cup beans
4 slices bread
1 tbsp. oleo
Coffee

The most liberal menu in each case was selected for analysis, and estimated amounts of protein, calories, calcium, phosphorus, iron, and vitamins contained in the diets were recorded and the figures compared with those of an adequate diet. Those cases which concerned children were measured similarly to that of single persons and couples, each member of the family having a separate diet analysis. The figures obtained from the children's diets were compared with minimal requirements for children of comparable ages.

The total cases studied numbered 264, with a total of 763 individuals for whom nutritional evaluations were made. Of these, 102 single persons were interviewed and diet analyses made, also 56 families of two persons (112 individuals) and 106 cases of families of three or more persons (549 individuals).

The percentage of cases found to be inadequate in fundamental requirements is startling. The type of protein consumed, for instance, is hardly sufficient for optimal development and body repair. Dried beans and cereals formed the most common source of protein in these diets, with only a few persons having eggs and liver and cheaper meat cuts.

Of the 102 cases of single persons analyzed, 72 per cent are inadequate in protein. Of the 56 cases of families of two persons, 48 per cent are inadequate, and of the 106 families of three or more individuals, 59 per cent. The average deficiency of all groups in protein is 62 per cent.

A surprising number of diets are low in calories, even though the type of food eaten (bread, beans, potatoes, stews) yields many calories. Caloric deficiency was noted for 68 per cent of the 102 single persons, 52 per cent of the two-person families, and 29 per cent of the families of three or more. The average deficiency of all groups in calories is 49 per cent.

It is unfortunate that the foods eaten by relief recipients are filling and cheap rather than of the nature of protective foods such as milk, fruits, and vegetables. The extent of mineral deficiency is great. Calcium intake is low in 80 per cent of the single individuals, showing that very few single persons include milk, eggs, cheese, or green vegetables in their diets. Families of

two persons have a like percentage of deficiency. Even in the families of three members, including children, the calcium-deficient comprise 72 per cent. All groups average a deficiency of 78 per cent. Dried beans yield some calcium and in most cases are the chief source of this mineral. Phosphorus is also low, but not to such an extent since the diet consists largely of beans, potatoes, and whole grain cereals. The greatest deficiency in this respect is in the group of single persons, 72 per cent. Families of two members have a better showing, being only 52 per cent deficient. Of the families of three or more, 52 per cent are deficient, making an average of 60 per cent of the total number deficient.

Iron is also low in the majority of cases. Again the more deficient in this respect is the group of single individuals, 79 per cent being low. Of the 56 couples, 68 per cent are deficient; and the families, 56 per cent. The average ratio of such deficiencies is 65 per cent.

In vitamins, all three groups show a high percentage of deficiency. Vitamin A is found to be deficient in the diets in 75 per cent of the cases of single persons, in 71 per cent of the families of two, and in 68 per cent of the families of three or more, averaging 72 per cent deficiency. Vitamin B intake is low in a large number of cases. The group of single persons has an 89 per cent deficiency, and of the total number of cases studied, 87 per cent are deficient. In vitamin C, 90 per cent of the single cases are deficient; in vitamin D, 97 per cent. Vitamin G also shows a high deficiency, or an average of 82 per cent.

These studies present a nutritional problem affecting men, women, and children in this community. For the most part, the children are of school age, and the heads of households are of three classes—employable, partially employable, and unemployable. Their diets will not afford them the well-being necessary to carry on normal, everyday activities and school work.

In this Denver relief group just such deficiencies exist as were found by Dr. Thomas A. Parran, Surgeon General of the United States Public Health Service, who has stated, "Forty per cent of the people of the United States are suffering from a new kind of starvation, attributed to faulty nutrition. The new kind of starvation may be even worse in its ultimate social effect than the ancient famines which periodically killed off a large part of the population." The very foods which the nation has in surplus are "those in which the national dietary is deficient—milk and milk products, citrus fruits, green vegetables, and meats."

MOBILE KITCHENS FOR BRITAIN

ELLA M. ECK

Whatever their ancestry or politics, all Americans are horrified at the suffering of civilians in England caused by the first extensive use of airplanes in bombing open cities in the history of the world. With many thousands of homes destroyed and families disrupted and scattered, the providing of shelter and food is a major problem.

To dietitians, the problem of providing food in quantity for these distressed civilians, rescue crews and fire-fighters has a special appeal, since they realize fully the difficulties involved in meeting the situation. In providing food in quantity for institutions, dietitians have specialized equipment, trained personnel and an established organization. In

England, catastrophe may strike in many places at once, where there is no equipment, no trained workers, nothing but hastily organized groups of civilians doing their best to provide food for many homeless people.

Dietitians, too, with their knowledge of nutrition, have a keener appreciation of the necessity for providing proper food for these suffering people. They realize the full effects of insufficient food upon health and physical endurance which in England are under tremendous strain. Further, they realize the importance of food in maintaining morale which will eventually determine the outcome of this war.

Specialized equipment such as mobile kitchens have been developed for providing food in the bombed areas. Trucks are equipped with facilities for preparing and holding food and utensils for serving food and hot drinks. Two hundred persons can be served at one time. Since these mobile kitchens can be sent wherever needed and contain all the necessary equipment, they provide the ideal solution to this problem.

The American Dietetic Association is sponsoring a project to raise sufficient money among its membership to purchase at least one of these mobile kitchens to be sent to England in behalf of the British dietitians. What more appropriate gift could this Association make than such equipment designed to provide adequate food in areas hit by catastrophe? Each member who has not already done so, is urged to contribute to this fund and to return her contribution using the blank attached to the special letter which has been sent to all members of the American Dietetic Association.

NEW TABLES ON NICOTINIC ACID VALUES

Bacharach, in the belief that it would appear to be worth while collecting all the available figures on the distribution of nicotinic acid in human and animal foods even though these have been obtained by a diversity of methods and may in many instances require drastic revision, has assembled such tables which are now available.[1] The consensus today is that nicotinic acid or its amide is indispensable for normal growth and health of both pig and dog, and that it can prevent or cure "maize sickness" in the former, and experimental black-tongue in the latter species.

For man, too, the compound seems to be as essential as for dog, pig and certain micro-organisms. Many pellagrins have responded dramatically to treatment with pure nicotinic acid or its amide. The fact that other pellagrins have required supplementary treatment with vitamin B_1, riboflavin, yeast extracts or liver preparations, before complete recovery, is no justification, according to Bacharach, for denying the identity of nicotinic acid and the pellagra-preventing factor of Goldberger. However, he states that the existence of simple uncomplicated pellagra is, on economic grounds, to be expected less often than a more general deficiency of the vitamins formerly grouped together as "vitamin B_2."

[1] Bacharach, A. L.: The distribution of nicotinic acid in human and animal foods, *Nutrition Abstracts & Reviews*, 10: 459, 1941. These tables are available on application to the Rowett Institute, Bucksburn, Aberdeenshire, Scotland. Price 1 shilling per copy.

BOOK REVIEWS

A Research Conference on The Cause and Prevention of Dental Caries. Sponsored by the Good Teeth Council for Children, Inc., 400 North Michigan Boulevard, Chicago, 1940. Pp. 178. Price $2.

This book reports in detail the research conference held in Chicago July 1–2, 1938, on the cause and prevention of dental caries. Papers were presented from nine laboratories in the United States and Canada where the etiology of caries is being studied. Dr. E. V. McCollum was the presiding officer, assisted by Dr. Nina Simmonds. A well-known bacteriologist, a pathologist and an orthodontist served as an advisory board.

To those who have been following closely the progress of research in this fascinating field, the papers will present no new data. The book, however, would be an invaluable source of information for anyone wishing to determine the status of knowledge of the cause of caries up to July 1, 1938. Each of the papers summarizes extremely well the work and viewpoint of the laboratory and staff represented.

Bodecker presents evidence to support his conviction that the teeth of young persons are permeable; that teeth may show a physiological resistance to decay; and that susceptibility to caries depends on the balance between the dental attacking factor and the dental protecting factor. Bunting of the University of Michigan School of Dentistry, Johnston from the University of Toronto, Hatton and Fosdick from Northwestern University Dental College and Rosebury from Columbia University College of Physicians and Surgeons show general agreement that the primary etiological factor is bacteriological and the dietary determining factor is, in some way, concerned with the carbohydrate content of the diet. The possible role of vitamin D was defended by McBeath of the Columbia University Dental School, who is in substantial agreement with Mellanby of England. The possible relationship of the composition of saliva was discussed by Becks of the University of California School of Dentistry and by Krasnow of the Guggenheim Clinic of New York. Bibby from the University of Rochester School of Medicine and Dentistry described his studies of the chemical and physical characteristics of teeth, while Moore of Philadelphia described her observations on the relation of a child's age to his susceptibility to caries, her conclusions being drawn from a study of the susceptibility to caries of a group of children under her observation for fifteen years.

All who are interested in the cause of this commonest disease of children, will find it well worth while to read and own this book. There is a lively discussion following each group of papers and a "free-for-all" in the last forty pages. This last section will serve to clarify the many seemingly discordant points of view.

Dr. McCollum's skill as a moderator is evident throughout the discussions. He holds the discussants well in hand but allows each to present fully his ideas. He gives an excellent summary of the whole conference at the close of the book.—MARTHA KOEHNE, PH. D., *Nutritionist, Ohio Department of Health.*

Manual of Applied Nutrition. Dietary Department, The Johns Hopkins Hospital. Baltimore, 1941. Pp. 86.

According to the introduction, "the diets in this manual have been compiled by the dietary department for the use of the visiting and house staff, nurses, dietitians and medical students. No attempt has been made to give diet lists, since the success of diet therapy depends upon the food order fulfilling the individual requirements of the patient. The plan has been to keep all dietary treatment simple, economical and practical, so that the hospital patient may learn, by example, the dietary treatment he is to use after his period of hospitalization. The physician is also invited to confer with the dietitian regarding specific cases."

Apparently the authors of this manual have thought of everything which could contribute to the smooth operation of the dietary department. Full information is given as to the routing of diet orders and the procedure in obtaining diet instruction from the dietitian, even including the several extension phone numbers of the dietary department subdivisions. Then follow concise and simple outlines of diets from the normal to the special or therapeutic, including such specific types as the Meulengracht, Evans, and Wilder Test diets. Many of the diet outlines give sample meal plans or references to the literature from which further information

may be obtained. Suggestions are made with regard to appropriate vitamin, mineral or other supplementation in all diets where certain nutritional needs are apt to be low. Helpful lists of acceptable liver extract products and of vitamin concentrates, including data concerning the content of each and form in which each product is marketed, are of added assistance to the busy physician. Many reference tables, in particular four pages of physiological data which are informative to the physician in diagnosis and of assistance to the dietitian, add to the value of the manual.

This is a distinctly progressive and up-to-the-minute compilation. It bespeaks the proficiency of the dietary department at Johns Hopkins and the intelligent appreciation of its medical staff with regard to the place of good nutrition in therapy.

Food Values of Portions Commonly Used. By Anna dePlanter Bowes and Charles F. Church, M.D. Available from Anna dePlanter Bowes, Philadelphia Child Health Society, 311 South Juniper Street, Philadelphia. Third edition. Pp. 31. Price $1.

Mrs. Bowes is to be congratulated on the success of her booklet for it is now in its third edition. Changes have been made in the data on vitamins, the effect of food values on various methods of preparation and that concerning the dietary requirements at various ages. Vitamin figures have been checked and revised, particularly those concerning A and G.

Recipes and Menus for Restaurant Profits. By Alice Easton. Stamford, Conn.: The Dahls, 1940. Pp. 212. Price $1.

This is a compilation of over 300 popular and profitable quantity recipes based on over 20 years of experience in home type of cookery for commercial use. Each recipe has been carefully worked out as to ingredients, time, temperatures, and simplification of service. Each of the recipes is numbered for cross checking with the 100 menus that are a part of the book. The menus are based on prices ranging from 50 to 75 cents with a food cost not exceeding 40 per cent of the selling price.

Taber's Cyclopedic Medical Dictionary Including a Digest of Medical Subjects. By Clarence Wilbur Taber. Philadelphia: F. A. Davis Company, 1940. Price, thumb-indexed $3, plain $2.50.

This is an attractive little book which lists within a small space 50,000 words or over 30,000 more than the previous edition. In its preparation Mr. Taber was assisted by several associates who are prominent in the various medical specialties and in nursing. It is moderately illustrated and contains more than 200 tabulations and an appendix including tables of measurement; average normal physiological standards and symbols used in scientific writing; anatomic tabulations of the muscles, nerves and veins; food and vitamin tables with definitions of vitamin units. Also will be found the principal medical abbreviations, glossary of Latin terms, English, Latin and Greek equivalents, Latin numerals, prefixes and suffixes, tables of physical constants of the elements, and for good measure, something which should be helpful to the dietitian and physician in the outpatient department and food clinic—a section entitled "The Interpreter" which in four languages includes the more essential questions which might be asked in interviewing patients who speak French, German, Spanish or Italian. This book is decidedly worth its modest price.

Economic Analysis of the Food Stamp Plan. A Special Report by the Bureau of Agricultural Economics and the Surplus Marketing Administration, U. S. Department of Agriculture, Washington, D. C., 1940. For sale by the Superintendent of Documents, Washington, D. C. Pp. 98. Price 20 cents.

This report gives a clear and interesting account of the theory and principles of the Food Stamp Plan, including details of the procedure followed with regard to blue stamps, orange stamps, problems of substitution, commodities purchased, effect of the plan upon diets of low income families, and reactions of the general public, trade groups, welfare officials and the press. A considerable collection of graphs and tabular material is presented. The appendix includes an analysis of the net effect of blue-stamp expenditures on low income demand, prepared by the Economic Analysis Section, Surplus Marketing Administration, U. S. Department of Agriculture; a summation of wholesale food sales in the experimental cities before and during operation of the Stamp Plan; and methods used by the Bureau of Home Economics in studying the effects of the plan on the diets of low income families.

CURRENT LITERATURE

American Journal of Digestive Diseases

Vol. 8, February 1941

The treatment of massive gastro-duodenal hemorrhage by the continuous administration of colloidal aluminum hydroxide. E. E. Woldman.—p. 39.

*The effect of orange juice on gastric acidity. F. W. Claytor, W. L. Smith and E. L. Turner.—p. 43.

*A comparison of the inhibitory action of different fats and fatty acids introduced into the duodenum on gastric contractions. W. I. Card.—p. 47.

*Why do some persons suddenly become sensitive to one or more foods? Editorial.—p. 63.

ORANGE JUICE AND GASTRIC ACIDITY. A test meal of orange juice stimulates a high free-gastric acidity which reaches its acme one hour following ingestion and remains in the stomach, on an average, one hour and 45 minutes following ingestion.

INHIBITORY ACTION OF FATS AND FATTY ACIDS. Fatty acids were far more effective than their corresponding fats in inhibiting gastric contractions. A linear relationship was demonstrated between the dose of fatty acid and the mean duration of inhibition.

SUDDEN SENSITIVITY TO FOOD. Many people suddenly become sensitive to a food previously always eaten with comfort. No definite explanation can be given. A certain amount of food might pass unchanged into the blood stream by going through the mucosa of the rectum or cardiac region of the stomach into the veins which pour their blood directly into the general circulation. In this way harmful material might escape destruction and detoxication in the liver. Sensitization may often take place through the alveolar spaces of the lung. At times the splitting of proteins is less complete than normal and intestinal absorption is defective.

American Journal of Diseases of Children

Vol. 61, February 1941

*Lead poisoning. A clinical and experimental study of the factors influencing the seasonal incidence in children. M. Rapoport and M. I. Rubin.—p. 245.

*Width-weight tables (revised). H. B. Pryor.—p. 300.

LEAD POISONING. Lead encephalopathy in infants and children has its greatest incidence in the spring and summer months. This seasonal incidence seems dependent on the vitamin D-producing action of sunlight, which increases the absorption of ingested lead.

WIDTH-WEIGHT TABLES. The old height-width-age tables are inadequate because they are based on averages and fail to recognize individual differences. A set of three tables has been constructed for each age and sex: one for narrow chests, one for average and one for wide chests.

American Journal of the Medical Sciences

Vol. 201, February 1941

*Nutritional aspects of the treatment of arthritis. R. Pemberton and C. W. Scull.—p. 250.

ARTHRITIS. Most arthritics experience benefit on a diet which provides an adequate supply of calories and is optimally balanced. Thirty calories per kg. affords a good starting point at rest except in those who are overweight. The diet should provide at least 1 gm. protein of good biologic value per kg. body weight. The conspicuously underweight individual should be given more, the grossly overweight individual less. Carbohydrate should supply from one-third to one-half the remaining calories needed and fat from one-half to two-thirds of the balance, unless intolerance for fat be manifested. There should be an abundance of inorganic salts and vitamins.

American Journal of Public Health and the Nation's Health

Vol. 31, February 1941

*Maternal and child health programs under the Social Security Act. E. F. Daily.—p. 117.

*Laboratory studies of methods for cleansing of eating utensils and evaluating detergents. F. W. Gilcreas and J. E. O'Brien.—p. 143.

*Nutrition education in a dental program. R. L. White.—p. 171.

MATERNAL AND CHILD HEALTH. An extensive program for strengthening national health services for children has been under way for more than 4 years under the Social Security Act. The health of children is a vital part of defense. There is a marked increase in the realization of the importance of teaching sound principles of nutrition as a basic part of any

program designed to improve the health of mothers and children.

CLEANSING EATING UTENSILS. An efficient detergent for cleansing of eating, drinking, and cooking utensils is a substance or compound soluble in water, which at a temperature of approximately 120° F. will provide complete removal of all types of characteristic soiling materials in a short period of time; will produce a free-rinsing surface; will reduce to a minimum the formation of a film of precipitated mineral salts and similar substances on the washed surface; and will function effectively in waters of varying hardness.

NUTRITION IN A DENTAL PROGRAM. The services of a nutritionist should be regarded as indispensable in every dental program. A sound, far-reaching program can be developed and maintained only through a specialist who has a thorough knowledge of the science of nutrition and technical skills in utilizing and imparting that knowledge. Every program of dental-nutrition education should focus attention upon the maintenance of the nutritional integrity of the individual as a whole.

Annals of Internal Medicine

Vol. 14, February 1941

The problem of rheumatism and arthritis; review of American and English literature for 1939. Part I. P. S. Hench, W. Bauer, M. H. Dawson, F. Hall, W. P. Holbrook, J. A. Key and C. McEwen.—p. 1383.

Archives of Internal Medicine

Vol. 67, February 1941

*Diseases of nutrition. Review of recent contributions. H. R. Butt and W. V. Leary.—p. 411.

DISEASES OF NUTRITION. Vitamins have been the main attraction in the study of nutrition within the past year. Evidence indicates that vitamins form an integral part of the enzyme system of the body and that clinical deficiencies of vitamins are usually multiple rather than single. The broad aspect of national defense has brought forward the discussions of national standards of nutrition and the fortification of foods.

Archives of Pediatrics

Vol. 58, February 1941

*Epilepsy: its treatment with a phenobarbital-belladonna synergism. C. E. Schotland and L. H. Loeser.—p. 87.
Hyperthyroidism in children. C. G. Kerley.—p. 92.

EPILEPSY. Twelve children, suffering from epileptic phenomena, were treated with phenobarbital and levorotary belladonna alkaloids. Nine showed a marked improvement.

British Medical Journal

No. 4181, February 22, 1941

*The metabolism, excretion, and human requirements of calcium. R. A. McCance.—p. 276.
Calcium requirements.—p. 281.

CALCIUM METABOLISM. Calcium is an essential element which is not easily absorbed. It forms salts which are insoluble in the intestinal juices. The requirements of bones and teeth demand that children shall store 2 gm. calcium per week from birth to 17 or 18 years. At least 3 times this amount must be supplied in the diet. Absorption and storage are facilitated by vitamin D.

Bulletin of the Johns Hopkins Hospital

Vol. 68, February 1941

*Factors influencing plasma prothrombin in the newborn infant. A. E. Maumenee, L. M. Hellman and L. B. Shettles.—p. 158.

PLASMA PROTHROMBIN IN NEWBORN. Infants with retinal hemorrhage show lower prothrombin levels than normal infants. The administration of vitamin K to mothers prior to the onset of labor almost entirely eliminates retinal hemorrhage in their infants.

Food Research

Vol. 6, January-February 1941

*A study of homemade ice cream. V. D. Foltz and W. H. Martin.—p. 31.
Riboflavin determination by the microbiological method. A. Arnold, S. T. Lipsius, and D. J. Green.—p. 39.
*Vitamin C content of tomatoes. A. P. Brown and F. Moser.—p. 45.
*Determination of carotene in fresh and frozen vegetables by an improved method. II. Carotene content of asparagus and green Lima beans. W. I. Zimmerman, D. K. Tressler, and L. A. Maynard.—p. 57.
*Effect of cooking upon the vitamin B_1 content of two types of beans grown in Michigan. E. Kelly and T. Porter.—p. 85.

HOMEMADE ICE CREAM. A study and analysis of 100 samples of homemade ice cream showed that the reasons and number of times mentioned for making homemade ice cream were economy, 55; taste, 34; convenience, 25; and safety, 15. The butterfat and total-solids content of 100

samples of homemade ice cream examined varied within wide limits, ranging from a low of 1.4 per cent fat to a high of 35.4 per cent, and a low of 17.84 per cent total solids to a high of 53.36 per cent. The bacteriological quality of homemade ice cream averaged lower than that of commercial ice cream collected in a survey somewhat earlier. This was undoubtedly due, in part, to the use of unpasteurized dairy products in some samples. The samples of homemade ice cream from pasteurized milk and cream and frozen in the refrigerator had an average bacterial count of 17,000 per milliliter which compares very favorably with the best factory-made ice cream. In comparing all samples, refrigerator-frozen samples were bacteriologically superior to tub-frozen samples.

VITAMIN C IN TOMATOES. Study of Stone tomatoes from five different experimental plots over three seasons, shows them to be a good source of vitamin C. An average value of 26.2 ± .39 mg. per 100 gm. was found for tomatoes from five different sources which were titrated immediately after being received at the laboratory. Some evidence was found which indicated an increase in vitamin C content with advance of the season. There was some evidence also to support a theory of an inverse relationship between vitamin C content and size of fruit. In neither case was the evidence conclusive. There was no indication of vitamin C loss when tomatoes were held as long as 18 days, either at laboratory temperature or in the refrigerator at 6.7° C. (44° F.). Tomatoes from vines supported on poles showed a mean vitamin C value that was significantly greater than that for tomatoes picked at the same time from adjacent vines which were not supported. Stone tomatoes grown in the greenhouse showed a mean vitamin C value approximately one-half as great as that of the same variety grown in an out-door plot near the greenhouse.

CAROTENE CONTENT, ASPARAGUS AND BEANS. The commercial processing of asparagus, green Lima beans, spinach, and broccoli for freezing and storage does not result in any appreciable loss of carotene.

VITAMIN B_1 CONTENT OF BEANS. Two types of beans (*Phaseolus vulgaris*) were boiled or baked according to standard procedures which would yield tender products. The processes employed in this experiment resulted in cooked beans which were estimated to have more available vitamin B_1 than the same beans in the raw state, as determined by the rat-growth method. The baked or boiled Michelite beans had a vitamin B_1 content ranging from 2.3 to 3 I.U. per gram of dry beans; the baked or boiled Cranberry beans, from 1.9 to 2.9 I.U. per gram. Beans boiled in the water in which they were soaked for 16 hours showed no higher vitamin B_1 content than those boiled in fresh distilled water after a similar period of soaking. Such a finding seems to indicate very little loss of this water-soluble factor during an overnight soaking period. Soda, used as a softening agent during soaking but thoroughly rinsed off before cooking, shortened the boiling time from 5 to 15 minutes but did not cause a destruction of vitamin B_1.

Hygeia

Vol. 19, February 1941

The restless colon. F. C. Yoemans.—p. 104.
Breast feeding and the doctor. F. H. Richardson.—p. 110.
*Riboflavin.—p. 116.
Pie—America's favorite dessert. H. M. Fyler.—p. 120.
*Not for war alone. N. Jolliffe.—p. 124.
Citrus fruits. J. F. Edwards.—p. 128.

RIBOFLAVIN. The greatest quantities of riboflavin are found in those plant and animal tissues in which the most active chemical changes take place, such as the leafy and germ portions of plants and the liver, kidney and heart organs. The adult requirement for riboflavin is about 2000 micrograms, for children somewhat less. Riboflavin is not seriously affected by heat but is destroyed by strong sunlight. The riboflavin content of some common foods is given.

ARMY RATION. Our Army constitutes the best fed group of our population. The American soldier consumes around 5000 calories, 148 gm. protein and 23 mg. iron daily, while the average American consumes only about one-half of these amounts.

Journal of the American Dental Association

Vol. 28, February 1941

Carbohydrate degradation by mouth organisms. III. L. Acidophilus. L. S. Fosdick and A. C. Starke.—p. 234.

Journal of the American Medical Association

Vol. 116, February 1, 1941

Studies of the principle in liver effective in pernicious anemia: recent advances in the purification of active substances. B. M. Jacobson and Y. Subbarow.—p. 367.

*The role of chlorides in alkalosis following the administration of calcium carbonate. J. B. Kirsner and W. L. Palmer.—p. 384.

*Vitamin C milk containing 600 U. S. P. units of vitamin D to the quart is not eligible for list of accepted foods.—p. 413.

Vol. 116, February 8, 1941

*Gout and gouty arthritis. P. S. Hench.—p. 453.

*The body economy of vitamin C in health and disease. H. C. Sweany, C. L. Clancy, M. H. Radford and V. Hunter.—p. 469.

*Desserts in the diets of adults and young children.—p. 506.

Vol. 116, February 15, 1941

*Chronic endemic selenium poisoning. M. I. Smith.—p. 562.

Vol. 116, February 22, 1941

*Human experimental scurvy. C. C. Lund and J. H. Crandon. p. 663.

*Plasma vitamin C and serum protein levels in wound disruption. J. B. Hartzell, J. M. Winfield and J. L. Irvin.—p. 669.

*Induced thiamine deficiency. Editorial.—p. 707.

ALKALOSIS. Alkalosis developed in 32 of 105 patients who received calcium carbonate in the treatment of peptic ulcer. There was no correlation between the severity of symptoms and the degree of chemical alkalosis. Alkalosis after the administration of calcium carbonate is primarily due to a deficiency of chloride and to consequent dehydration. The alkalosis may be combated successfully by the administration of adequate quantities of sodium chloride and fluid even though the ingestion of calcium carbonate is continued.

VITAMIN D MILK. One quart vitamin D milk containing 400 units vitamin D is equivalent in vitamin D potency to one and one-third teaspoons minimum strength U.S.P. cod liver oil. For the prevention of rickets, for good bone and tooth development and excellent growth the vitamin D requirement of the full-term, artificially-fed baby is satisfied if each quart of milk contains 300 to 400 U.S.P. units vitamin D. Babies receiving human milk may require less. For children between infancy and adolescence, a daily allowance of 750 to 1000 cc. milk containing from 300 to 400 U.S.P. units vitamin D permits ample retention of calcium and phosphorus. The requirements of adults are not known; during pregnancy and lactation the requirement is increased. The Council has voted not to include in the list of accepted foods any brands of milk containing more than 400 U.S.P. units vitamin D per quart.

GOUT. Gout is fairly common in the United States. It is a disease of unknown etiology characterized by (1) arthritis; (2) supposed abnormality in the renal excretion of uric acid; (3) hyperuricemia; (4) eventual deposits of sodium urate crystals in articular, periarticular and subcutaneous tissues; (5) frequent terminal vascular lesions in the kidneys, sometimes in the heart and brain. Gout results from some endocrine deficiency, abnormal renal insensitivity to urates, selective renal insufficiency for urates alone, a "storm in the vegetative nervous system", or an allergic reaction to proteins.

VITAMIN C. In moderately advanced cases of tuberculosis there was a slight unsaturation of vitamin C after 10 to 12 days on a basic diet including 31 mg. vitamin C a day. In the more advanced cases there were varying degrees of "exhaustion" of vitamin C appearing to be proportional to the severity of the disease and the intake of vitamin C. Patients on nonresidue peptic ulcer diets, patients following massive operations, and alcoholic addicts are prone to become unsaturated with vitamin C. Special diets high in vitamin C will prevent or relieve the unsaturation, but on rare occasions it is more suitable to give the vitamin C intravenously. Vitamin C exists in increasing concentration in proportion to the vitality of the cells. Adequate vitamin C is just one of the many factors necessary for a proper treatment of tuberculosis.

DESSERTS. From the physiologic point of view the custom of ending the meal with a dessert probably serves completely to satisfy the appetite and provides a final psychic stimulus to the secretion of gastric juice. Desserts with a high content of sugar or fat or both have a high satiety value. The approximate composition of some representative desserts is given. To be

acceptable to the Council, commercial dessert products represented for use in feeding young children must contain milk or fruit or a combination of these two ingredients in amounts which constitute at least 50% of the total weight of the product.

SELENIUM POISONING. Though human poisoning in selenium endemic areas from the ingestion of naturally occurring seleniferous foodstuffs has not been definitely established, the evidence of absorption of selenium in such areas, sometimes in amounts sufficient to cause harmful effects in experimental animals, appears to be conclusive.

SCURVY. A vitamin A-free diet produced scurvy in man at the end of 5 months, and certain symptoms were severe at 6 months. The ascorbic acid level of the blood plasma fell to zero in 42 days and that of the white blood cells in 122 days. A wound healed well after the subject had been 3 months on a scorbutic diet but not after 6 months. Vitamin C deficiency may be a factor in failure of some human wounds to heal. A dietary history should be taken on all patients subjected to major surgery. If long-continued and marked deficiency of vitamin C intake is indicated, the patient should be given daily from 1 to 4 gm. ascorbic acid.

WOUND HEALING AND VITAMIN C. The nutritional condition of a patient is a most important factor in wound healing. To maintain life or repair tissue there must be a supply of proteins, fats, carbohydrates, minerals, water and vitamins. Periods of inanition or faulty nutrition are likely to deplete the carbohydrate and fat stores and to lower serum protein and vitamin levels. If normal healing is to be expected, the ascorbic acid and serum protein levels of the blood plasma must be kept at normal concentration.

INDUCED THIAMIN DEFICIENCY. Withdrawal of thiamin from the diets of humans produced fatigue, lassitude and loss of interest in food. The time of development of severe symptoms seemed to be related to physical activity, the more active subjects developing symptoms earlier. Depressed mental states, generalized weakness, dizziness, backache, soreness of muscles, dyspnea, insomnia, anorexia, nausea, vomiting, loss of weight, slight roughness of the skin and atony of muscle were encountered. Capacity for muscular work fell progressively.

Journal of Biological Chemistry

Vol. 137, February 1941

*Calcium in the alimentary tract of the rat. W. H. Adolph and C. Liang.—p. 517.

*Influence of different nutritional conditions upon the level of attainment in the normal increase of calcium in the growing body. C. S. Lanford, H. L. Campbell and H. C. Sherman.—p. 627.

*The absorption and fate of free citric acid in the rat. C. A. Kuether and A. H. Smith.—p. 647.

Vitamin K activity and structure. L. F. Fieser, M. Tishler and W. L. Sampson.—p. 659.

*The role of the external secretion of the pancreas in lipid metabolism. The prevention of fatty livers in depancreatized and duct-ligated dogs by the daily feeding of fresh pancreatic juice. M. L. Montgomery, C. Entenman, I. L. Chaikoff and C. Nelson.—p. 693.

*The role of the external secretion of the pancreas in lipid metabolism. The influence of daily ingestion of pancreatic juice upon the level of blood lipids in completely depancreatized and ductligated dogs maintained with insulin. C. Entenman, I. L. Chaikoff and M. L. Montgomery.—p. 699.

CALCIUM IN ALIMENTARY TRACT. When calcium, as borogluconate, is injected intravenously into rats fed a low calcium diet, there is no significant increase in the calcium content of the intestinal tract. In the rat the intestinal tract does not excrete calcium in amounts which are related to the metabolic calcium level.

NORMAL INCREASE OF BODY CALCIUM. Attainments in the normal developmental increase of body calcium were studied in rats. Increasing the calcium content from 0.35 to 0.48 to 0.64% resulted in successive increases in percentage of body calcium at a given age, the difference induced by each of these stepwise increments being one-tenth to one-twelfth at the period of most rapid growth and about one-thirtieth at full maturity.

CITRIC ACID ABSORPTION. Free citric acid administered orally to the albino rat is rapidly absorbed. The absorbed citric acid appears to be transformed into liver glycogen.

EFFECT OF PANCREATIC JUICE ON LIVER. Fatty livers produced either by excision of the pancreas or by duct ligation can be completely prevented by the daily ingestion of fresh pancreatic juice. This observation establishes an

essential function for the external secretion of the pancreas: namely, the maintenance of a normal lipid in the liver.

EFFECT OF PANCREATIC JUICE ON BLOOD. The ability to raise the cholesterol, phospholipid, and total fatty acid content of the blood, in raw pancreas, is demonstrated to be associated with the external secretion of the gland. The daily ingestion of pancreatic juice was effective in raising the low levels created by lack of replacement therapy and in maintaining the normal levels of cholesterol, phospholipid, and total fatty acid in the blood of completely depancreatized and duct-ligated dogs maintained with insulin.

Journal of the Missouri State Medical Association

Vol. 28, February 1941

*Acne vulgaris. R. L. Sutton.—p. 50.

ACNE VULGARIS. Acne vulgaris is a metabolic disease. It depends on imbalance between the dietary intake of lipoids and the patient's capacity for metabolizing them. Milk and milk products, being particularly rich in fat, are the commonest harmful ingredients in the diets of patients with acne.

Journal of Nutrition

Vol. 21, February 1941

*Iron balances on four normal pre-school children. T. Porter.—p. 101.

*Effect of A.T.10 (dihydrotachysterol) on rickets in rats produced by high-calcium low-phosphorus diets. A. T. Shohl and S. Farber.—p. 147.

*The calcium content of the normal growing body at a given age K. E. Briwa and H. C. Sherman.—p. 155.

*A quantitative study of vitamins in the rumen content of sheep and cows fed vitamin-low diets. III. Thiamin. L. W. McElroy and H. Goss.—p. 163.

*Riboflavin contents of some typical fruits. C. S. Lanford, B. Finkelstein and H. C. Sherman.—p. 175.

Effects of parathyroid deficiency and calcium and phosphorus of the diet on pregnant rats. M. Bodansky and V. B. Duff.—p. 179.

*The distribution of pantothenic acid in certain products of natural origin. T. H. Jukes.—p. 193.

*The effect of diet on the pantothenic acid content of eggs. E. E. Snell, E. Aline, J. R. Couch and P. B. Pearson.—p. 201.

IRON BALANCES IN CHILDREN. In 35 iron balances on 4 normal preschool children, 3 and 5 years old, the average level of retention represented about 22% of the intake of iron or 0.07 mg. per kg. body weight per day. The replacement of plain farina in the basal diet with an equivalent quantity of farina fortified with irradiated yeast containing 120 I.U. vitamin D had no significant effect on iron retentions.

DIHYDROTACHYSTEROL IN RICKETS. A.T.10, an irradiation product of ergosterol, in amounts which approximate toxic dosage, is effective in prevention of experimental rickets in rats fed a high-calcium low-phosphorus ricketogenic diet. This is 80 times the amount needed when rats are on a low-calcium high-phosphorus diet. A.T.10 exerts its effect principally on the excretion of phosphate in the urine; and to a lesser extent on the absorption of calcium. It is primarily the calcium and phosphorus metabolism that determines whether rickets is present or not.

NORMAL CALCIFICATION. Normal rats at a given age were compared as to whether the percentage of body calcium differed materially with the body weight of the animal: *i.e.* with the rate at which it had grown. Such comparisons were made independently with animals from three different diets representing successive levels of liberality of calcium intake. The larger animals showed the same percentage of body calcium as the smaller animals of the same age. Age is the predominant determining factor in the increasing percentage of calcium in the body.

THIAMIN IN RUMEN CONTENTS. Studies on sheep and cows confirm and extend the work of earlier investigators in indicating that thiamin is not a dietary essential for ruminants.

RIBOFLAVIN IN FRUITS. The citrus fruits, banana, and tomato appear richer in riboflavin than the pome fruits as represented by apple and pear.

DISTRIBUTION OF PANTOTHENIC ACID. The pantothenic acid content of 68 products, involving more than 200 bio-assays, is tabulated. Wide variations exist in various samples of the same product. Brewers' yeast, liver, eggs, broccoli, molasses and peanut meal are excellent sources of pantothenic acid.

DIET AND PANTOTHENIC ACID IN EGGS. Eggs from hens maintained since hatching on a diet low in pantothenic acid showed a markedly

lowered pantothenic acid content. This increased rapidly when the diet was supplemented with synthetic pantothenic acid. The pantothenic acid content of the egg is directly proportional to that of the diet.

Journal of Pediatrics

Vol. 18, February 1941

*Dark adaptation and vitamin A. Further studies with the biophotometer. P. C. Jeans, E. L. Blanchard and F. E. Satterthwaite.—p. 170.

A comparison of two methods of measuring dark adaptation. R. E. Eckardt and L. V. Johnson.—p. 195.

*The absorption of vitamin A in celiac disease Interpretation of the vitamin A absorption test. C D. May and J. F. McCreary.—p. 200.

Treatment of hypoprothrombinemia in the newborn infant. R. B. Lawson.—p. 224.

DARK ADAPTATION AND VITAMIN A. Results obtained with the biophotometer are consistent and correspond with the vitamin A status of the subjects. Normal subjects with ample vitamin A intake have normal test results at all times. The most frequent and usual cause of impaired adaptation seemed to be a utilization deficiency resulting from infection. A seasonal incidence of dysadaptation was observed, the greatest number of instances in the winter and the smallest in the fall.

VITAMIN A ABSORPTION IN CELIAC DISEASE. A low rise in the level of vitamin A in the blood during the vitamin A absorption test is a constant feature of celiac disease.

Pennsylvania Medical Journal

Vol. 44, February 1941

*A study of consecutive cases of hypertension and albuminuria in pregnancy.—p. 557.

HYPERTENSION AND ALBUMINURIA IN PREGNANCY. Hypertension and albuminuria occurred 1477 times among 13,978 deliveries at the Boston Lying-in Hospital, a frequency of 1 in 9. Medical treatment consisted of hospitalization, rest in bed, limitation of fluids, low-salt diet, and free saline catharsis. Patients with hypertension and albuminuria who receive adequate prenatal care have a low incidence of eclampsia and the mortality rate is thereby lowered.

Public Health Nursing

Vol. 33, February 1941

*Prevention and care of nephritis. H. L. Gartshore and O. E. Guttentag.—p. 80.

NEPHRITIS. Early recognition and treatment of nephritis are imperative if the disease is to be cured before it reaches the stage when kidney destruction is "irreversible". Men and women are equally affected by nephritis. Race does not seem to play a role but family predisposition may exist. The disease most frequently attacks the young.

Public Health Reports

Vol. 56, February 21, 1941

*New educational film to aid nutrition compaign.—p. 352.

Vol. 56, February 28, 1941

*Domestic water and dental caries. I. A dental caries study, including L. acidophilus estimations, of a population severely affected by mottled enamel and which for the past 12 years has used a fluoride-free water. H. T. Dean, P. Jay, F. A. Arnold and E. Elvove.—p. 365.

NUTRITION FILM. The United States Public Health Service cooperated in the production of a motion picture entitled, "Proof of the Pudding", designed primarily to acquaint the public with the importance of the right choice of food in maintaining health. Scenes in a nutrition laboratory emphasize the fact that our knowledge of the dietary needs of human beings is based on scientific research. Results of specific dietary deficiencies are demonstrated in animals.

FLUORINE AND CARIES. Beauxite pupils with moderate to severe mottled enamel and exposed to fluoride-free water for 12 years showed less dental caries than a comparable group of Benton pupils without mottled enamel who had used fluoride-free water during their lifetime. The L. acidophilus counts reflect a difference in caries activity.

Science

Vol. 93, February 14, 1941

*P-aminobenzoic acid, a vitamin. S. Ansbacher.—p. 164.

P-AMINOBENZOIC ACID. The vitamin, p-aminobenzoic acid, is a chromotrichia factor for the rat and a growth-promoting factor for the chick. It is probably a member of the vitamin B complex.

Southern Medical Journal

Vol. 34, February 1941

*Observations on the effectiveness of a yeast-peanut butter mixture in vitamin B complex deficiencies. T. D. Spies, H. M. Grant and J. M. Grant.—p. 159.

*Hypoprothrombinemia and vitamin K in nutritional deficiency states. E. D. Warner, T. D. Spies and C. A. Owen.—p. 161.
*"Pot liquor": a neglected source of vitamin C for the feeding of infants. M. L. Keller.—p. 163.
*Ariboflavinosis, with special reference to the ocular manifestations. V. P. Sydenstricker, A. R. Kelly and J. W. Weaver.—p. 165.

NUTRITIONAL DEFICIENCY STATES. In 23 patients with mild deficiency diseases improvement followed the daily ingestion of a yeast-peanut butter mixture. The total effect is not due to the nicotinic acid, riboflavin and thiamin alone, since per unit of weight this compound contains as much carbohydrate as potatoes, more protein than steak, and one-half as much fat as butter.

HYPOPROTHROMBINEMIA AND VITAMIN K. Study of the prothrombin level in patients having pellagra and associated nutritional deficiency states indicates that a vitamin K deficiency is not common.

VITAMIN C FOR INFANTS. The old custom of feeding "pot liquor" to babies was of value in furnishing fairly adequate amounts of vitamin C. Turnip greens and cabbage are relatively rich in vitamin C while string beans are not. Only "pot liquor" derived from vegetables rich in vitamin C contain significant amounts of ascorbic acid.

ARIBOFLAVINOSIS. Superficial vascular keratitis is the earliest and most common visible manifestation of riboflavin deficiency as well as a reliable index of early deficiency of the B group of vitamins.

INSTITUTION MANAGEMENT

American Restaurant Magazine

Vol. 25, February 1941

*Watch portion costs and your food cost will take care of itself. G. L. Wenzel.—p. 30.
*Howard Johnson methods feature highway food-service along the Pennsylvania turnpike. F. C. Lyons.—p. 36.
*American foods hold the spotlight. L. D. Freeman.—p. 38.
*Tropical fruit pie. M. B. Strause.—p. 42.
*Restaurants help to popularize American wine with meals.—p. 44.
*Menu planning in the modern restaurant. M. Mitchell.—p. 45.
*Will your rest rooms measure up?—p. 46.
*National association's educational program now being launched. T. D. Gibbons.—p. 62.

PORTION COSTS. Stresses importance of a legitimate or standard specification trim on every meat cut. Gives sample beef and veal specification forms with headings: on hand, portions, order, cut, important points, legitimate cut, number of bones, measurements, weights, quotations #1, #2, #3 to be used in simplifying the control of portion costs as secured from each of the various wholesale cuts of the carcass.

HIGHWAY FOOD SERVICE. Nine highway stations under the management of the Howard Johnson organization are now located along the new Pennsylvania turnpike. "Midway Station," the main restaurant, is already planning to double its size. Eight other intermediate stations offer luncheonette and car services. Complete meals are on the menu at "Midway Station" while the other units specialize in lighter lunches besides serving ice cream and featuring fried clams and a deluxe frankfurter sandwich. Quick service at "Midway Station" is maintained with a staff of 28 waitresses in the main dining room and 22 men and women in the culinary department. For truckmen, there is a counter lunchroom operating 24 hours a day, a bunk-room and a lounging room.

AMERICAN DISHES. Featured American foods range from the Creole type of New Orleans to chowders and boiled dinners of New England. Included are breakfast, luncheon and dinner menus giving actual food cost per portion and suggested menu prices per meal combination.

TROPICAL FRUIT PIE. The recipe combines crushed pineapple, pineapple juice, quartered banana slices, red cherries and a clear glaze using pineapple juice, sugar, water and tapioca flour.

WINES. Progressive restaurants have been popularizing the drinking of American wines with meals. Since the board has sponsored the use of menu clip on cards, such a card suggesting sherry as an appetizer produced a 300% increase in sherry sales at Ricketts in Chicago. Response is just as prompt if the card is removed for sales drop. The Edgewater Beach Hotel in

Chicago has just issued a new wine list devoted to the wines of the United States exclusively.

MENUS. Menu prices must give average food cost for normal rate of profit and since price changes on the menu cannot be made for a short period of time, items should not be included on the menu if their costs are out of line. Economical purchasing of meat ensures full value from each cut and prevents the waste of left-over raw scraps or pieces adhering to the bone. A limited menu selection makes for efficient operation, service of quality food and a volume business.

REST ROOMS. A program of cooperation with restaurants provides inspection service of restrooms by 50 field men and an "Approved Rest Room Certificate" to be posted in each room that passes inspection standards.

RESTAURANT MANAGEMENT COURSE. The evening course in restaurant management sponsored by the National Restaurant Association at Northwestern University gives two hours of college credit in the School of Commerce and is indicative of the major importance the educational program has been given under Grace E. Smith's leadership as national president.

Chain Store Age

Vol. 17, March 1941

Parties for employees.– p. 22.
*New equipment and services.—p. 30.

EQUIPMENT. The National Cash Register Company have a social security record book and receipt pads to assist in keeping social security data, priced at $1.50. Air is restored to true "freshness" by the Dorex Odor Adsorbers made by the W. B. Connor Engineering Corporation, and costs of operating the air-conditioning system are reduced by permitting recirculation of large currents of conditioned air. A new low desk 29″ high has been designed by the Shaw Walker Company and is said to lessen fatigue and increase office efficiency by ensuring a more natural working position. The Carrier Corporation offers a new wall-type carrier cold diffuser which maintains a constant temperature, predetermined humidity conditions, proper air circulation and carefully washed air without taking up valuable storage space.

Consumers' Guide

Vol. 7, November 1940

*Consumers work for more milk.—p. 6.
*Some light on lighting.—p. 12.

Vol. 7, December 1940

*What grade of eggs do you buy?—p. 3.
*Answers to food stamp plan questions.—p. 9.
*Milk glossary for consumers. Part 5.—p. 12.

MORE MILK. The Consumer Milk Committee of the District of Columbia found that an average of less than a pint of milk per person per day was being consumed by the people of Washington. Many of the families were getting no milk. In 18 months the committee succeeded in getting milk delivered for 2 and 3 cents less than the prevailing per quart price, and have helped bring "5-cent milk" to thousands of Washington's relief families.

LIGHTING. The necessity of proper illumination as presented by the Department of Agriculture outlines the different kinds of lighting and the different kinds of lamps and bulbs which should be used for various purposes. Higher wattage electric bulbs may be more economical than low wattage bulbs since one 100-watt bulb gives as much light as two of 60 watts or six of 25 watts. The new silver bowl electric bulbs provide indirect lighting. The fluorescent lamp, although it requires a special socket and a controlling device, has the advantage of giving more light, with the same wattage, than ordinary bulbs.

GRADES OF EGGS. Eggs are graded into 4 grades: U. S. Special, U. S. Extra, U. S. Standard and U. S. Trade. Candling shows the size of the air cell inside the round end of the egg, the firmness and clearness of the white, the position of the yolk, its mobility and its freedom from spots and blemishes. Labels of federal-graded eggs bear not only the grade, but also the date when graded and specify the weight and size in the three top grades. "U. S. Specials" must weigh 24 oz. per doz. and all 12 eggs must be uniform in size; "U. S. Extras", 20½ oz. per doz. and reasonably uniform in size; and "U. S. Standards", 17 oz. per doz. and may be variable in size.

STAMP PLAN. The Food Stamp Plan is a device to raise farm incomes by giving consumers more money to buy the food farmers grow, and

"Plain and Party Food for 2 or 4 or 6"—contains 72 tested recipes which can be combined to make delicious, highly nourishing meals that range from simple, inexpensive breakfasts, lunches and dinners to party fare with all the frills.

These recipes can also be most helpful in putting the "quart of milk a day," generally recommended by nutritionists, into appetizing, delicious food that is more wholesome because of its whole milk and vitamin D content.

How It Is Accomplished

The extra milk-richness of these dishes is due to the fact that in creating the recipes, full advantage has been taken of the outstanding qualities of Irradiated Pet Milk. Used undiluted, Pet Milk puts into food more than twice the amount of whole milk substances that ordinary milk would supply. It can be diluted with less than an equal amount of another liquid—meat stocks, fruit juices, vegetable liquids—to increase the mineral and vitamin content of the food and to improve its flavor. Diluted with an equal amount of water, Pet Milk contains 4.06% butterfat which is higher than that generally provided by ordinary milk.

At A Saving In Cost

Pet Milk, with its extra vitamin D, still costs less generally than ordinary milk—less than coffee cream—much less than whipping cream.

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to raise the health standards of Stamp Plan families by giving them the power to purchase foods they otherwise cannot afford to buy. Under this plan low income families receiving public assistance are permitted to buy orange stamps to the value of the money which the family ordinarily spends for food. They are then entitled to a certain number of free blue stamps which they can exchange for any food which the Secretary of Agriculture has designated as a "surplus" food. The Stamp Plan has been in operation since May 16, 1939. By December 15, 1940 the plan had been extended to 250 places and between 2,500,000 and 2,800,000 people were being served.

MILK GLOSSARY. The Director of Marketing has the task of gearing together the various agencies in the Department of Agriculture dealing with marketing and to connect these activities with those of other federal and state agencies. Agencies dealing with milk, for instance, are the Surplus Marketing Administration, the Bureau of Home Economics, Bureau of Dairy Industry and the Consumers' Counsel Division. Diseases transmitted by milk, and from which there are 30 to 50 outbreaks each year in the United States are tuberculosis, typhoid fever, scarlet fever, diphtheria, septic sore throat, and undulant fever. Milk distributors are those engaged in the receiving, processing, and distribution ot milk. Distributing milk takes roughly 50% of the consumer's milk dollar. According to the standard of identity established under the Federal Food, Drug, and Cosmetic Act ot 1938, dried skim milk must not contain more than 5% water. Under a definition of the Food and Drug Administration, dried whole milk must contain not less than 26% milk fat and not more than 5% water. A pound of this product, now packed in sealed containers to prevent the fat from turning rancid, is the nutritive equivalent of 3½ quarts fresh whole milk.

Food Industries

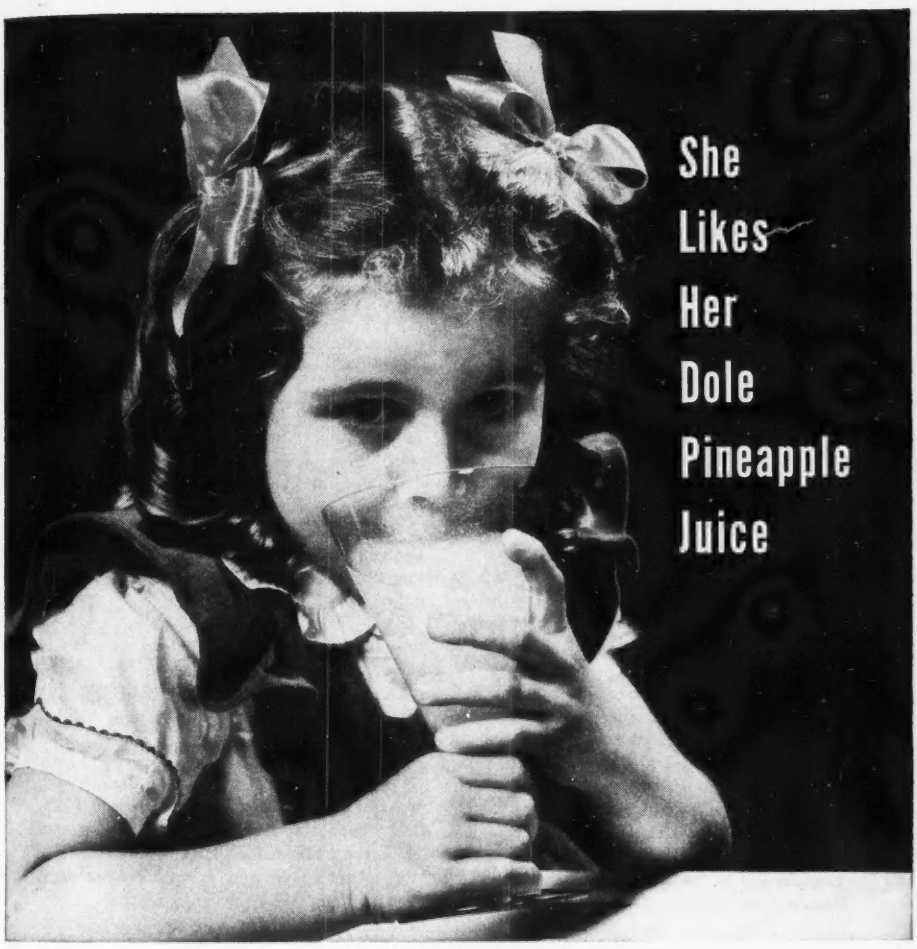
Vol. 13, March 1941

*Why consumer-preference tests? W. Platt.—p. 40.
*Developing and improving foods by consumer testing. D. Cowan.—p. 41.
Do consumers have good taste? C. L. Arnold.—p. 45.
*A method of consumer product testing. J. L. Bogert.—p. 47.
*Interpreting what we find out. W. Platt.—p. 50.
*"U. S." grade labels gain converts. I. C. Miller.—p. 51.
*The package is on the spot. W. F. Howell.—p. 54.
*Confusion about fortification. O. Skovkolt.—p. 56.
*Western Hemisphere cheeses replace European imports. A. Chaffee.—p. 58.
Allocating costs to raw materials purchased in random sizes. H. S. Schucart.—p. 61.
Use of dry sugar in sweetening foods canned in sirup. Part 2. O. B. Braun, G. L. Hays and H. A. Benjamin. —p. 64.
*12 causes of springers in cans. G. V. Hallman.—p. 67.
Vinegar as food preservative.—p. 96.
*Incubation temperatures for bacteria counts.—p. 96.
*Determining the maturity of frozen peas.—p. 96.
Vitamin B_1 enrichment of bread.—p. 96.
*Function of lipids in milling and baking.—p. 98.
*Neutralizing acid in grape juice.—p. 98.
*Blanching pears for juice.—p. 98.
*Vitamin C in milk.—p. 99.
*Solubility of milk-sugar compounds.—p. 99.
*Creamery fat losses.—p. 99.
Egg yolk oil.—p. 99.
Fatty acids in cottonseed oil.—p. 99.
Drip control in frozen fish.—p. 100.
Vitamin B_1 in foods.—p. 101.
*Soybean lecithin to protect vitamins in baking.—p. 101.
*Overrated antiseptic power of onions.—p. 102.

CONSUMER PREFERENCE TESTS. Information about food for the consumer is yearly becoming more urgent. Several types of consumer preference tests are explained and general principles which apply to all forms of such tests. Tests to determine likes and dislikes for a given product differ from sales analyses, market surveys and so forth, and require a special technique if reliable results are to be obtained.

FOOD MAIL TESTS. Direct testing reveals characteristics of products which consumers like or dislike in comparison with competing products. No matter how important the positions held by various members of a testing committee, their sense of taste, smell, hearing and sight vary in keenness. The man within the company whose product is being tested, is naturally influenced by his own product for he manufactured it to please his own tastes many years before and forgets the newer generation may prefer a different type of product. Testing through mail is accurate if questions and instructions are clearly stated.

PRODUCT TESTING. The questionnaire method of testing products has proved the competitive position of a large number of items. As far as possible, approximately normal conditions should be observed and a careful record of occupational, racial and economic status of each



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member kept. This type of test not only shows how acceptable the product is at first but also whether this acceptability varies with continued use.

INTERPRETING CONSUMER TESTS. The planning, execution and interpretation of results in the various types of consumer tests present a problem since every test must conform to basic considerations of special techniques and every test is an individual problem. The results of tests bring new insight and knowledge which can serve to improve the food product.

"U. S." GRADE LABELS. The grading of canned foods began in 1934 when Great Atlantic and Pacific Tea Company applied A.B.C. grading to many of its labels. Many canners and distributors have not adopted the grade label but have merely added descriptive and informative material to their labels.

PACKAGES. Machine packaging in the factory assures quality, protection, sanitation, economy and guaranteed weight, and prevents tampering or adulteration of contents.

CHEESE. American cheese brokers, once dependent on European importations, are now turning to Argentina, Canada and the United States for substitutes for famous cheeses. Among more important types of cheese which can no longer be shipped to America are French Roquefort, all Italian hard cheeses including Provoloni, Reggiano, Gorgonzola and Sardo, English Stilton, Netherlands Edam and some Scandinavian goat's milk cheeses. Although America has never been "cheese conscious", agricultural colleges have been experimenting with cheese types and America is fast producing the imported type cheeses.

SPRINGERS IN CANS. In the canning industry, a "springer" refers to a can one end of which is slightly bulged, and when end is forced in the other end is pushed out; a "flipper", one end of can becomes bulged on percussion but when pushed in remains flat. In meat canning industry these latter frequently are called "springers." The twelve causes of springers in canned meats are: overfilling, low closing temperature of product when can is exhausted by heat, insufficient vacuum when obtained by mechanical means, delay between closure and processing of cans, incipient spoilage of product, leakage of can, excessive distortion of can ends during processing, rough handling and denting of can, changes in altitude and temperature of storage, type of ends, chemical reaction between ingredients of product, chemical reaction between product and can.

BACTERIA COUNTS. The Boston Board of Health has adopted 32° C. instead of 37° for incubation in bacterial counts on milk. This temperature tends to increase the higher counts and milk sources of supplies needing more sanitary attention are shown up clearly.

FROZEN PEAS. New method for grading frozen peas proves less tedious and more accurate. It does not take into consideration color and appearance but determines the specific gravity of thawed peas by means of the difference between the weight of the sample in air and the weight in a liquid, in this case a mixture of xylene and carbon tetrachloride.

FUNCTION OF LIPIDS. Lipids have an influence on keeping quality and baking quality of flour. Gluten is closely associated with the lipids in flour and owes some of its desirable characteristics to their presence.

GRAPE JUICE ACID. In order to have the most desirable proportion of free tartaric acid a certain amount of malic acid must be present. Too much malic acid requires the addition of a low acid such as lime juice; sugar content must be determined before deciding amount of tartaric acid to leave in juice.

PEAR JUICE. Blanching pears removes much of the tannin and some acid from the juice and tends to make it cloudy and difficult to filter. The juice from raw pears is more sparkling and clear.

VITAMIN C IN MILK. Pasteurizing under normal holding methods reduces vitamin C content of milk about 20%. Flash pasteurizing is less destructive. Homogenization, adding vitamin D concentrate, and the use of sodium metaphosphate or enzyme to produce soft-curd milk, have no effect on vitamin C. More C retained if milk is kept from all copper con-

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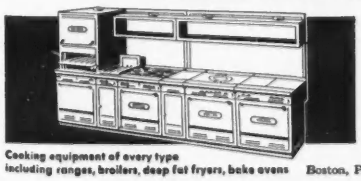

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SOLUBLE MILK SUGAR COMPOUNDS. The concentration of salt in water determines the solubility of milk sugar. A table of lactose solubilities for various concentrations of 24 salts is given, which should interest those working on whey and milk sugar. With calcium chloride, bromide and iodide, lactose forms compounds which can be crystallized.

CREAMERY FAT LOSSES. Some states set a maximum over-run in manufacture of butter. Some of over-run is due to water added in cream rinsings and in the neutralizer. Other losses may be due to fat in buttermilk, fat in excess of the legal 80% minimum in butter, fat in overweight packages and other miscellaneous items.

SOY BEAN LECITHIN. Enrichment of bread with vitamins D and A is hindered by their thermal instability. A small proportion of soy bean lecithin or even soy bean oil serves to ensure that the added vitamin potency is retained in the baked product.

ANTISEPTIC POWER OF ONIONS. Tests with yellow Globe and white Texas onions show that not even pure onion juice will inhibit the growth of some of the common bacteria. Some bacteria will remain alive but stop growing. The power of the juice to kill is weakened by heat and exposure to air but is retained in the onion after four months of storage.

Hospital Management

Vol. 51, February 1941

Past 25 years mark development and recognition of the dietary department in hospitals. L. R. Wilson.—p. 60.
*A calavo in your diet.—p. 63.

CALAVOS. There are 99 varieties of avocados from the 3 families, Mexican, Guatamalan, and West Indian. Calavo is useful in high fat, ketogenic and diabetic diets and their use makes possible many attractive combinations that add variety to hospital menus. Types of market units and fruit sizes are included. Most practical for hospital use is a "flat" weighing 21 lb., containing 96 calavos. Includes recipes for soup, salads, and desserts.

Hotel Monthly

Vol. 49, February 1941

Well done food service. p. 10.
*Mission inn a hotel that became a wonderland.—p. 11.
**Meals on wheels, Pullman style. L. C. Armfield.—p. 20.
A "costs of operation" survey.- p. 24.
For better country hotels. E. A. Boss.- p. 27.
An executive housekeeper speaking.- p. 33.
*Special menus for chil !ren. A. Shircliffe. p. 34.
*The coffee shop. W. O. Waidelich.- p. 41.
*A new fruit beverage. p. 52.

CALIFORNIA INN. Mission Inn, created by the late Frank Miller, with its amazing collection of art treasures, historical objects, collections of various kinds, displayed in public rooms, is a delightful place to stop when visiting California.

MEALS ON WHEELS. To render approximately 5 million individual services a year to passenger guests the Pullman Company Commissary requires all new employees to go through a period of training at the central school in Chicago. The school room contains a replica of one side of a Pullman car with all the necessary equipment. Course consists of lectures, demonstrations, performances, and field trips under careful supervision. Besides the training for recruits, a course of retraining, lasting for one week, is given once a year to cooks having more than 10 years experience and twice a year to those having less. Because it is impossible to have the full force under constant and close supervision, each car is equipped with a copy of the "Repertory for Commissary Employees and Culinary Guide." This includes instructions for marketing, preparation and service of food, along with illustrated pictures, a dictionary of cooking terms, special regulations and general information.

MENUS. Children's menus, unless handled by employees who see the value of the idea, will be fruitless. If well executed they are an excellent advertising medium. Special menus with colorful designs, simple rhymes and jingles appeal to the youngsters. Includes a list of dishes served to children in 50 different establishments who cater to children. The selective menu is an ideal basis for building all three meals.

COFFEE SHOP. Cleaning is a big item of side work in the coffee shop that is done before, during and after a busy day. Never clean

Foods for the Adult Special Diet

featuring . . wide variety
. . low fibre content
. . minimum seasoning
. . pleasing flavor
. . high nutritive values

America's Best-Known Baby

Gerber's Cereal Food

A nourishing, easily digested cereal for babies, Gerber's Cereal Food is well suited to certain adult special diets. It is enriched in iron and the B_1 vitamin (thiamine). And its palatable flavor particularly appeals to an adult's taste.

Gerber's Strained Foods

In the 15 varieties of Gerber's Strained Foods, both seasoning and fibre content are held to a minimum. The home-grown vegetables and selected fruits are very finely strained. The wide variety includes 2 soups (combinations of vegetables and meat), 7 vegetables and 5 tempting desserts.

Gerber's Junior Foods

There are 10 varieties including chopped vegetables. All are slightly seasoned for added flavor.

Gerber's *Baby Foods*

Send for complimentary copy of "Recipes for Special Diets" and Professional Reference Cards. Gerber's, Dept. 235, Fremont, Michigan.

when guests are nearby and always use a clean mop. Only constant attention keeps Venetian blinds free from dust. Ability to serve a good cup of coffee is an asset to any eating place; cleanliness in the preparation is the first step to success. Always give urn a complete flushing after cleaning and before using. Regular scraping of the bottom of the chairs and tables is necessary to keep gum off your customers' clothes. To remove gum quickly from conspicuous places use either carbon tetrachloride or rub ice over the gum and then scrape with an old knife. At stated periods during the day the waitresses change the table cloths for paper place mats. Each waitress is responsible for folding sufficient napkins to carry her through the rush periods. Menu changing and clipping on of special bills is the duty of the head waitress and her assistant.

APPLE RASPBERRY. "Apple raspberry," a new beverage, is a pure fruit juice prepared from a mixture of black and purple raspberries blended with apple juice extracted from sound, hand-picked and washed Baldwin and Cortland apples. The blended fruit juice has a deep purple color and a full rich raspberry flavor as developed at the State Experiment Station, Geneva, New York.

Journal of Home Economics

Vol. 33, March 1941

Home economics and consumer education. P. H. Nystrom.—p. 145.

Place of home economists in the defense program. M. F. Cunningham.—p. 152.

*The masters theses—a symposium.—p. 159.

*Advertisements of window textiles. I. L. Brandt and R. A. Allen.—p. 175.

*Information about defense.—p. 178.

*The calcium content of southern California head lettuce and its distribution in the outer and inner leaves. M. G. Mallon and F. P. Urey.—p. 182.

THE MASTER'S THESIS. It is desirable for the sake of graduate study as well as of independent research to have a well defined research program in which problems of small scope may be a part. There are two general types of problems both of which would be appropriate for theses and might have true home economics stimulus: one, a problem of theoretical or academic aspect in a branch of related fundamental subject matter, such as chemistry, psychology, physiology, economics, or history; the second, a problem whose results would be immediately useful to home economics. When the student is assisted in choosing her problem, it is important that the faculty adviser keep in mind that the purpose of the problem is the teaching of the student and not the furthering of the instructor's own research program. The time allotted for completion of the thesis, the equipment and other facilities available, and inaptitudes within the student herself set up barriers against certain kinds of problems. The four principal types of theses are: the "library type" which covers only the available literature on a subject; the thesis which involves the compilation, analysis, and interpretation of data obtained from official record and reports; the "survey type" where questionnaires, check lists, schedules, and interviews are widely used in securing a clear picture of current conditions, practices, or points of view; and the "experimental type" which involves measuring something. There are certain criteria by which the suitability of a type of thesis may be judged.

WINDOW TEXTILES. In a study of the advertisements for glass curtains, drapery material, and shade cloth, criteria were formulated by which such information might be judged. In general, a fair amount of information was made available and stated in specific terms. There were instances, however, of indefinite statements such as "much longer lasting finish", "cost little", "shrinkage is greatly reduced", "triple-tested finish." The information given was generally descriptive or factual. No fraudulent claims were noted, and the only misleading statements were those containing a somewhat loose use of terms. The information was so presented as to be easily understood by a person with very little training in textiles.

DEFENSE. Some of the articles recommended as sources for information on the national defense program include: *United States Government Manual*, Fall 1940, sold by the Superintendent of Documents, Washington, D. C., at 75 cents a copy; *Defense*, the official bulletin of the Advisory Commission of the Council of National Defense, subscriptions to which are received by the Superintendent of Documents, Washington, D. C., at 25 cents for 13 issues or 75 cents for 52; *The American Red Cross and*

To Prevent the Vitamin and Mineral Insufficiency of

SPECIALIZED G-I DIETS

The bland diets required in the treatment of gastrointestinal disease frequently make adequate nutrition a difficult matter. By their very nature such dietaries usually are deficient in important minerals and vitamins. New Improved Ovaltine presents a valuable aid in overcoming this difficulty.

The recommended three glassfuls daily, made with milk* according to directions, provide 2578 I. U. vitamin A, 302 I. U. vitamin B_1, 491 S. B. U. vitamin G, 327 I. U. vitamin D, 1.05 Gm. calcium, 0.903 Gm. phosphorus, 8.9 mg. highly available iron, and 0.75 mg. copper.

Since it is chemically as well as mechanically bland, this pleasant food drink does not evoke excessive secretion of gastric juice, nor does it lead to increased peristalsis. Low curd tension makes it more easily digestible than milk alone and facilitates gastric emptying.

The contained proteins are of high biologic value, and the carbohydrate and well emulsified fat are readily absorbed. High diastatic power aids in the digestion of starches.

The palatable taste of Ovaltine overcomes the aversion to bland diets so often engendered by their monotony.

**Based on average reported values for milk*

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Ovaltine now comes in 2 forms—plain, and sweet chocolate flavored. Serving for serving, they are virtually identical in nutritional value.

• • •

Physicians are invited to send for individual servings of New Improved Ovaltine. The Wander Company, 360 North Michigan Avenue, Chicago, Ill.

National Defense, which may be obtained on request from the American Red Cross, Washington, D. C.; and *Health and Welfare Services in National Defense*, issued by the National Social Work Council, 1790 Broadway, New York, at 5 cents a single copy.

LETTUCE-CALCIUM CONTENT. The percentage of calcium in three separate lots of California Iceberg No. 152 was 0.019, 0.033, and 0.027% for what is usually considered the edible portion, that is, the inner head. Corresponding lots of New York Imperial, No. 615, had a calcium content of 0.030 and 0.031%. Thus, lettuce grown in soil "used the year round" is not lower in this mineral. The outer leaves, usually discarded for the retail market, represented about one-third or more of the entire plant by weight and were found to have a calcium content about three times that of the head.

Modern Hospital

Vol. 56, March 1941

•Kitchen planning in reverse. G. A. Carlander.—p. 90.
Food for thought.—p. 91.
•Personnel pays cash—and likes it. L. Wilkonson.—p. 92.
Holiday tray decorations.—p. 96.

KITCHEN PLANNING. In planning a new kitchen for the Northwest Texas Hospital, central service lifts were located first and the kitchen planned around them. Unit is designed to be compact and to avoid cross traffic. The same cafeteria counter is used for patients' trays and personnel. Floor plan is included.

PERSONNEL PAYS CHECK. In the Dietary Department at Barnes Hospital, St. Louis, the remodeled kitchen and dining rooms include a pay cafeteria offering a selective menu for personnel. Meal tickets are issued to interns, student nurses and student dietitians. Other members of the personnel pay cash.

Nation's Schools

Vol. 27, March 1941

•Are our young men "soft"? W. E. Forsythe.—p. 25.
•After defense jobs, what? P. T. Orata.—p. 26.
•Program for defense. J. W. Studebaker.—p. 47.
•Skill in straight thinking. G. D. Stoddard.—p. 60.
•Nutrition in a small cafeteria. B. E. Brown.—p. 74.
•Facts on fats and oils. S. Kay.—p. 75.
•Typical 10 cent plate lunches.—p. 76.

YOUNG MEN. Dr. Warren Forsythe, director of student health service at the University of Michigan, gives a general health picture of today's young men as compared with that of 20 years ago, on the basis of college records of student examinations. Asserting that personal opinions should be viewed critically, Dr. Forsythe feels that the health of present young men is probably superior to that of their fathers at the same age, and that their services should be inferior in no way.

DEFENSE JOBS. The effect of learning new skills incidental to defense upon postwar adjustment creates the problem of arranging new learning situations to facilitate rather than inhibit adjustments. Cultural *vs.* vocational training is discussed.

DEFENSE PROGRAM. Suggesting the importance of two elements in an educational program for common defense: an expanding program for vocational preparedness, and the development of a program designed to create moral and spiritual preparedness, the author shows the weight of responsibility for spiritual defense of America to rest upon the schools and colleges.

STRAIGHT THINKING. Methods to improve children's habits of thinking include the encouragement of genuine questions, constant guidance in the development of objective thought, and efforts to provide actual experiences as the basis for abstractions. These factors are discussed by the author, who concludes that "if brain power is to be mobilized and devoted to a high order of social service, it is our children growing into men who must lead the way."

SMALL CAFETERIA. A summary of menus, food service, and practical psychology employed in encouraging students to eat the nutritious lunches provided in the small cafeteria of the Wilkes-Barre Day School, Pennsylvania. Although emphasis is placed on learning to eat a variety of foods, individual tastes are regarded, and interest in well balanced lunches is further stimulated through biology study, poster pictures and food charts.

FATS AND OILS. Classification of fats and oils, method of making shortening, characteristics

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and uses of the various oils, and a chart giving time and temperatures for cooking various foods are points included in this concise review of fats and oils. Factors to consider in frying receive special attention: namely, the kinds of fat used, preparation of the food, method used, and care of fat and frying equipment.

PLATE LUNCHES. Typical 10¢ plate lunches as suggested by the Bureau of Child Hygiene, Ohio Department of Health, are listed for two different school cafeterias in Ohio. Thirteen simple but nutritious menus are planned, the items totaling between 15 and 17 cents if purchased individually.

Restaurant Management

Vol. 48, February 1941

•Tick-tock milk bar.—p. 14.
"Management's" merchandising calendar for 1941.—p. 22.
How Earl sells sea food.—p. 24.
Melody Lane—Hollywood's newest and distinctive restaurant. W. O. Voegele.—p. 28.
•300% increase in sales—with hamburgers!—p. 32.
•Good food hints. L. P. DeGouy.—p. 36.
•"Proportions may mean much—or little." A. W. Dana.—p. 38.

Vol. 48, March 1941

Visit Alabama's finest drive-in. G. H. Watson.—p. 14.
Ad. man looks at restaurants. L. Clark.—p. 17.
Ideas of the month.—p. 19.
•Table of equivalents for baking. L. P. DeGouy.—p. 24.
•What's new in Chicago.—p. 28.
•Chart of peaches and cherries.—p. 32.
Ideas for wine sales. H. A. Caddow.—p. 36.
•Good food hints. L. P. DeGouy.—p. 38.
•Standard weights and measures for meats and fish.—p. 40.
Equipment news for March.—p. 44.

RESTAURANT STUDY. This article, a technical and pictorial study of a successful new restaurant, includes floor plan, breakfast, luncheon, and dinner menus, portion sizes, average check, most popular foods, 60 suggestions on service and 30 on personal appearance and conduct.

FOOD SALES. A 300% increase in sales in a coffee shop was effected by featuring a popular dish at a popular price.

FOOD HINTS. To remove excess fat from soup wrap a piece of ice in gauze or cheesecloth or paper towel and run over the top of the soup. The fat will congeal and collect on the cold surface. Do not put meat in the oven until it has been out of the ice-box or refrigerator for half an hour, otherwise the meat tends to get tough.

PROPORTIONS. Charts analyze proportions and costs of coffee and cream, creamed chicken, and corned beef hash. Creamed chicken is figured according to the proportion of chicken to cream sauce for 5 oz., 5½ oz., and 6 oz. portions. When the proportion of chicken to cream sauce was 8 oz. to 1 qt., a 5-oz. portion costs $.10, 5½-oz. portion, $.11, and a 6-oz. portion, $.12; when the proportion of chicken to cream sauce is 16 oz. to 1 qt., a 5-oz. portion costs $.142, a 5½-oz. portion, $.156, and a 6-oz. portion, $.17. This shows clearly the importance of the two variables—portions and proportions.

BAKING EQUIVALENTS. A table of equivalents is given with the ingredients listed, followed by columns for weights and measures for each product in units of tsp. and oz., tbsp. and oz., ¼ cup and oz., ½ cup and oz., ¾ cup and oz., and 1 cup and oz., and the number of cups per pound.

CHICAGO RESTAURANTS. Some of the specifications used in the newer restaurants in Chicago are listed and described: stainless steel, copper, galvanized iron, insulator, woodwork, hardware, plumbing connections, hinged doors, glass doors, sliding doors, refrigeration, drawers. Pictures of floor plans, unusual features, and costs of the following restaurants are shown: Knotty Pine, Shore Post, Moran's, and the Harvey Grill.

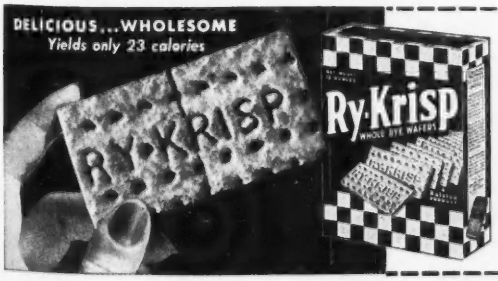
PEACH AND CHERRY CHART. The peach chart lists the following varieties: Belle, Carman, Champion, Clings, Clingstone, Elberta, Golden Jubilee, Hiley, Hale, Late Crawford, Roberta, Salway, Smock, U. S. Fancy, U. S. No. 1 Extra, U. S. No. 2 Extra, classified as to orchard, average size, flesh, color, variety, season, main uses and general uses. The varieties of cherries listed are: Bing, Black Tartarian, Duke, Early Richmond, English, Lambert, Montmorency, Morello, Napoleon, Republican, Richmond, Royal Ann, Windsor, U. S. No. 2, U. S. No. 3, U. S. No. 4. Includes source, color, average size, sweet or sour, flesh color, season, equivalent of weight and measure, and how to serve.

Ry-Krisp Low-Calorie Diets widely recommended ... Easy to follow, supply all dietary essentials

Ry-Krisp Low-Calorie Diets (1200 calories for women, 1700 for men) supply all essentials of good nutrition with the possible exception of vitamin D. The diets permit weight loss of about ¼ pound a day, list a wide variety of everyday foods from which the obese person may choose his own menus. Use coupon for free supply. Ry-Krisp is of value as bread in a reducing diet because each all-rye wafer yields only 23 calories, furnishes 7 International Units vitamin B_1 and its high pentosan and crude fiber content encourage normal elimination.

Now Ready! Digest of Studies on Obesity

A résumé of authoritative findings regarding the causes, dangers and diet-control of obesity is now available to dietitians. This valuable reference material is printed in handy notebook size, complete with bibliography. Useful as study sheets in nutrition classes. For professional distribution only. Indicate quantity wanted on coupon.



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GOOD FOOD HINTS. New food ideas are suggested for various dishes and recipes are included. One especially good suggestion is a honey nut topping for coffee cake: combine butter, flour, strained honey, chopped nuts and salt and spread over the top of the cake before it is baked. Sauces, shepherd's pie, mushrooms, and rice are discussed and unusual methods of preparation given.

MEAT AND FISH WEIGHTS AND MEASURES. An accurate scale is indispensable in the modern kitchen and most buyers now buy to specifications and use scales to ensure proper portions. Chart lists beef, pork, veal, lamb, poultry, fish, shell fish, oysters, and clams, and cuts or types of each. Table d'hôte, à la carte, and banquet portion weights are given.

Responsibilities of the Dietitian

Unfortunately, in some hospitals, the dietary division has come to consider itself an orphan, no one paying any attention to it except the superintendent who has to supply the budget allowance to carry on. In general, however, this is not so. The dietary department is as important as the therapeutic and diagnostic divisions such as the laboratory or x-ray division. The dietitian should cooperate with the physician in the treatment of not only the patients receiving special diets but in the treatment of all patients. She should take part also in the educational functions of the hospital, a very important function, in the teaching of student dietitians, student nurses, medical students and interns. The dietitian is also responsible for carrying out the policies of the institution in her own department, besides supervising its personnel.

In addition to her influence in the hospital, we have come to realize that the dietitian is having an influence on the prevention of disease and promotion of health in the community. Her contact with the family, the school child, the student and others whom she educates along the lines of sound dieting guides their future physical condition. There is no better place in the hospital to accomplish this latter function than in the out-patient department.—*Piazza, F., The Nutrition clinic in the out-patient department, Hospitals, April, 1941.*

blessings on thee little man...

The blessings of sunlight and simple, quiet existence are often beyond the realization of today's children. Numerous cases of borderline deficiencies are being constantly observed by the profession.

Studies* in groups of all ages have shown that COCOMALT added to the diet results in substantial gains. The vitamin-mineral character of COCOMALT supplies important nutrients in diets of young and old . . . vital elements that must be present in optimal amounts to insure vibrant health. COCOMALT is a *delicious* beverage that acts as an incentive to drink more milk.

Cocomalt. . . contains calcium, phosphorus, iron, vitamins A, B_1, D, G . . . Quick energy and body building nutrients.

COCOMALT-DELICIOUS MALTED
FOOD DIETONIC FOR ALL AGES

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*Archives of Pediatrics—56:Nov., 1939
Medical Record—Aug. 21, 1940

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NEWS NOTES

National Officers Speak at State Association Meetings. Following is the itinerary of members of the Executive Board, A. D. A., who are speaking before dietetic associations:

Mary I. Barber: April 19, Baltimore, "Feeding the American Soldier"; April 25, Richmond, "The Nutritionist in the Defense Program"; April 26, Greensboro; May 8, Chicago, Panel Discussion at Tri-State Hospital Meeting.

Gladys E. Hall: March 7–8, Urbana, Illinois; March 17, Cincinnati, "Activities of A. D. A. in Defense Program"; March 21–22, Lexington, Kentucky, "A New Challenge to Dietitians and Nutritionists" and "Problems in Feeding Hospital Patients"; April 6–8, Pullman, Washington, "Role of A. D. A. in the Defense Program"; April 25–26, Orlando, Florida; May 3, Atlanta, Georgia.

Margaret Cowden: April 29–30, Columbus, Ohio, "National Defense as a Responsibility of the Dietitian."

Nell Clausen: April 26, Oklahoma City, Oklahoma, "Administration."

Mary P. Huddleson: May 1–2, Buffalo, New York.

Bessie Brooks West: April 25–26, Oklahoma City, Oklahoma, "Do You Know Your National Association?"

Nelda Ross: March 14–15, Houston, Texas; March 17, Dover, Delaware; March 18, Washington, D. C.; April 25–26, Charleston, South Carolina; May 5, Baltimore, Maryland; May 22–24, Philadelphia, Pennsylvania; June 12, Providence, R. I.

Mary M. Harrington, chairman of the Military Status Committee, spoke before the Kansas Dietetic Association on March 21.

Quantity Food Service Recipes Cover Receives Award. At a recent advertising exhibit at the Philadelphia Art Museum the jacket design of the American Dietetic Association's *Quantity Food Service Recipes* received the highest honor and the gold star and certificate. The artist, Miss Lydia Bacon, is a daughter of Mr. E. W. Bacon of the J. B. Lippincott Company.

"I Am An American" Day. The President of the United States, at the request of Congress, has issued a proclamation designating Sunday, May 18, as "I Am An American" Day. In the proclamation President Roosevelt urges "that this day be observed as a public occasion in recognition of our citizens who have attained their majority or who have been naturalized within the past year. And I do call upon all Federal, State and local officials, and all patriotic, civil, and educational organizations to join in exercises calculated to impress upon all our citizens, both native-born and naturalized, the special significance of citizenship in this Nation." It is believed that the proper observances of this day will help bring home to all the value and responsibilities of our citizenship and give an opportunity to welcome into our American membership those who have become citizens in the past year. Ceremonies and celebrations will be sponsored by national and local organizations such as civic clubs, patriotic organizations, fraternal societies, schools, social agencies and other interested groups in each community.

Mary Foley Camp for Diabetic Children. In recognition of Miss Foley's work with diabetic patients, particularly children, the summer camp at Rochester, Minnesota, has been named in her honor. Announcement of this was made at a public health lecture February 27 at the Mayo Clinic.

The diabetic camp is conducted at Camp Kahler, a short distance from Rochester, in cooperation with the Boy Scouts, Girl Reserves, and Girl Scouts. Here the diabetic children, under the care of a doctor and a dietitian, can participate in a normal program of camping.

Miss Foley was director of dietetics for the Kahler Corporation from 1920 until 1932 when she entered the Mayo Clinic as consulting dietitian. She was appointed assistant professor of medicine (dietetics), The Mayo Foundation, in 1935. Miss Foley is responsible for the instruction in diet of all diabetic patients who come to the Mayo Clinic, and for years has collaborated with Dr. Wilder and others on the medical staff in the publishing of the seven consecutive editions of *A Primer for Diabetic Patients*.

The Ellen H. Richards Institute. The growing interest in the accumulation of research data which will lead to the improvement of

WAKE UP DROWSY APPETITES WITH A VARIETY OF CEREALS!

EVERY MORNING—
Brighten Patients' Breakfasts With A Different Post Cereal

● It's easy to please patients with this breakfast variety. Delicious Post Cereals for individual service are cellophane-wrapped for freshness, easy to handle and low in cost. Why not try them for breakfast tomorrow? Your patients will enjoy them, especially when served with fruit.

EXTRA ENERGY. Easily digested Post Toasties now contain full Vitamin B_1 content of choice white corn.

HIGH FOOD VALUE in Grape-Nuts, a distinctive, rich-flavor food of wheat and malted barley.

TEMPTING FLAVOR and other Grape-Nuts benefits are also present in these delicious Grape-Nuts Flakes!

GENTLE REGULATOR. Post's 40% Bran Flakes are rich in food essentials—extra good with fruit!

NEEDED BULK. Under physician's direction Whole Bran Shreds provide *palatable* full-strength bran.

NOURISHMENT found only in selected whole wheat is abundantly supplied by crisp, golden Huskies.

INDIVIDUAL PACKAGES FOR BETTER SERVICE

Save time and trouble—serve Post Cereals in Individual Packs. Cellophane wrapped to keep their finer flavor fresher! Each package contains the right amount for one patient.

Let your General Foods man help with all your food problems. He's an expert—and glad to be of service!

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standards of living in the three fields of food, clothing, and shelter, has led the trustees of the Pennsylvania State College to establish the Ellen H. Richards Institute as a consolidated working research unit covering some of the investigations formerly carried on in the Departments of Chemistry and Home Economics and in the Agricultural Experiment Station at the college.

Research studies in human nutrition, begun in 1935, will be continued in the Institute. These include a pioneer investigation on the relationship of dietary intake to family nutritional status, and a similar study in child nutrition begun cooperatively with the Department of Health of the Commonwealth in 1936. In both of these investigations, people chosen in different communities in Pennsylvania as representative of various socio-economic and racial groups are being studied in order to learn their food habits, degree of growth, skeletal status, hemoglobin, vitamin status, and numerous other evidences of nutritional well-being. Efforts to change nutritional status for the better by such means as parental or child education and the provision of a school lunch have been tried and the results measured.

Dr. Pauline Beery Mack, who has been on the staff of the School of Chemistry and Physics at the Pennsylvania State College since 1919 and director of research in home economics at the college since 1935, will be the first director of the Institute.

Family Budget Sheet. A copy of the F.W.A.A. Family Budget Sheet and explanation of its use is now available upon application to the Family Welfare Association of America, 130 East 22nd St., New York, at a cost of 65 cents per hundred. The material was worked out by a committee under the chairmanship of Mrs. Luise K. Addiss of the Community Service Society of New York. Full details are included as to the use of the budget sheet, as well as current references on the subject of family budgets.

Inspectors of Food Wanted for the War Department. The United States Civil Service Commission has announced an examination under the title of "Inspector, Subsistence Supplies" for positions in the Quartermaster Corps of the War Department. The salaries for the various grades range from $1,620 to $2,600 a year, less a 3½ per cent retirement deduction.

The duties of the positions involve inspectional work in connection with such food supplies as fruits and vegetables, condiments, beverages, and staples. Also included among the duties are keeping records and handling correspondence incident to the inspectional work. Applicants must show experience in the inspection, or purchase and inspection, of a variety of foodstuffs. Laboratory testing experience in food products, or certain appropriate college study may be substituted for the experience.

Food Dehydrators Form Association for National Defense Needs. To develop production methods to meet almost certain demands for dehydrated foods for national defense was the objective of a meeting of representatives of the dehydration branch of the food industry held recently in Chicago. Others in attendance were Colonel Paul D. Howe of the Office of the Surgeon General, U. S. Army; Dr. Samuel Prescott, dean of science, Massachusetts Institute of Technology; and Drs. Walter H. Eddy, H. B. Surtzer and Lawrence Burton. Mr. Lawrence K. Harper, vice-president of Sardik Food Products and Mr. C. E. Birgfeld of the Department of Commerce, presided. Over $156,000,000 worth of dehydrated foods were required here in 1917, the first year of the first World War. In view of the probable tin shortage and the need of this metal for purposes other than national defense, it was pointed out that the necessity for rapid, prompt expansion in the dehydrated food industry is pronounced. The primary purpose of the meeting was to form an organization among the dehydrators and distributors of dehydrated foods with a view to the ways and means to meet this need, and the establishing of standards covering dehydrated foods, and the contracting for and rotating of foods among dehydrating plants in order to eliminate waste of operating time.

Cans for Fruits and Vegetables is the title of Simplified Practice Recommendation R155-40 published by the National Bureau of Standards, U. S. Department of Commerce. This covers sizes and designated use of cans for packing fruits and vegetables, and was proposed and developed by the Committee on Simplification of Containers, National Canners' Associa-

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IN SMALL QUARTERS

at Meal Time

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THE BRAWNY LAD ELECTRIC RANGE *"takes on" your cooking job and does it faster . . . prepares special food better*

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tion, and is based on a comprehensive survey of existing practice. Tables list the names, dimensions, capacities and designated use of cans; products packed in specified sized cans; and the list of "acceptors" of the aforementioned simplified practice recommendation prior to its publication. Copies may be purchased from the Superintendent of Documents, Washington, D. C., for 5 cents each.

Food and Drug Administration. Establishment of the following tea standards for the year beginning May 1, 1941, under the terms of the Federal Tea Act, was announced March 13: Formosa Oolong, Formosa Black, Congou, Java (to be used for all fully fermented teas excepting China, Japan and Formosa), Japan Black, Japan Green, Japan Dust, Gunpowder (to be used for all China green teas), Scented Canton (to be used for all scented teas), and Canton Oolong. These standard samples, put up in half-pound tins, are used by tea examiners of the Food and Drug Administration, furnished at cost by the Federal Security Agency to importers and shippers of tea, and are distributed by the Supervising Tea Examiner of the Food and Drug Administration at New York.

Hearings on proposed standards for Neufchatel, cottage and creamed cottage cheese, according to a March 11 release, were postponed to April 21, and that on cream cheese was to be reopened.

Hearings for the consideration of proposed standards of quality for canned apricots, peaches and pears, as published in the Federal *Register* of December 11, 1940, were resumed on April 1.

New Commission on Nutrition. The board of trustees of the Medical Society of the State of Pennsylvania, at a meeting in December, established a commission on nutrition and deficiency diseases in accordance with a recommendation adopted by the house of delegates. Dr. Herbert T. Kelly, Philadelphia, has been appointed chairman of the commission, which proposes to disseminate the newer knowledge of nutrition and to study the causes, prevention, early recognition and medical management of nutritional deficiency.

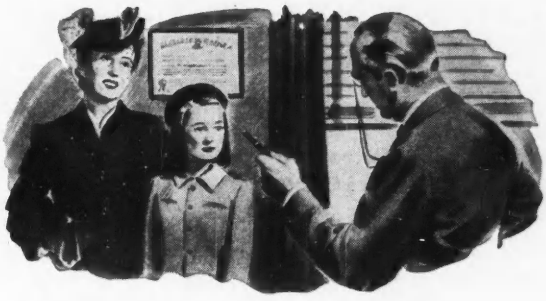
Enriched Bread. Dr. James A. Tobey, Department of Nutrition, American Institute of Baking, has prepared a folder of information for bakers concerning the reasons why bread should be enriched, how it may be done effectively and inexpensively and how it should be labelled. According to the folder "enriched bread" may be white bread, slightly darker bread made from special process flour, milk bread, or raisin bread, which contains in addition to the usual ingredients proper amounts of thiamin (vitamin B_1), nicotinic acid, and iron. The amounts of such enrichments should be as follows: thiamin—not less than 1 mg. nor more than 2 mg. per pound of baked bread, or from 333 to 667 I.U. per pound of bread; nicotinic acid—not less than 4 mg. nor more than 8 mg. per pound of bread; iron—not less than 4 mg. nor more than 16 mg. per pound of bread. Riboflavin (vitamin B_2), vitamin D, and calcium may be added but are not specifically required. The folder suggests that the bread be so enriched by the use of enriched flour, the use of enriched yeast, vitamins and minerals in powder form; or combinations of these last. In addition to usual legal requirements, such as the weight of the loaf, the name of the baker, and his address (city is sufficient) the wrapper must show in easily readable type the words "Enriched Bread."

Frosted Foods. That the quick-freezing industry, despite bottlenecks and priorities, will continue to expand, was the prediction of Mr. Clarence Francis, president of General Foods Corporation, at a round-table discussion attended by leaders in the field of nutrition at the Waldorf-Astoria, New York, March 13.

The Hon. Paul V. McNutt, Defense Coordinator of Health and Welfare, spoke on the importance of proper nutrition to the health of the nation and Dr. Faith Fenton, professor of nutrition at Cornell University, discussed the high retention of vitamin C and other protective nutrients in quick-frozen foods as compared with ordinary fresh foods purchased in the market.

Mr. Francis emphasized the fact that frosted foods require no supplies from abroad and are therefore no drain on ocean shipping space. A minimum of rail and trucking space is needed, because waste is eliminated at the source, and likewise a minimum of storage space since only edible parts are stored.

Tracing the years of experimentation, the retail introduction of the first frosted foods into a few stores in 1930, Mr. Francis cited



Q. *We serve canned foods at our house, of course. But are they all right for children?*

A. *Indeed they are. Canned foods are nutritious and wholesome and include some of the most valuable sources of the dietary essentials which should be present in abundance in the child's diet.*(1)

(1) The nutritive values of canned foods have been the subject of numerous investigations, the results of which have repeatedly demonstrated the value of commercially canned foods as sources of the essential nutrients that should receive special attention in planning the child's diet. For further particulars the references below may be consulted. *American Can Company, 230 Park Avenue, New York, N. Y.*

1939. Accepted Foods and Their Nutritional Significance, Council on Foods of the American Medical Association, Chicago.

1939. Food and Life; Yearbook of Agriculture, U. S. Dept. of Agriculture, U. S. Government Printing Office, Washington, D. C.

1939. Canned Food Reference Manual, American Can Company, New York.

1938. Nutrition Abstracts and Reviews 8, 281.

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statistics showing the growth of the industry, the reduced cost of show cases, machinery, and prices of the finished product.

Dr. Fenton suggested that the relatively high vitamin content of quick-frozen peas may be explained by the fact that they require only half the cooking time of the fresh peas, and also that the enzyme which hastens oxidation of vitamin C is inactivated during blanching previous to frosting.

Recently Proposed State Legislation. S.306, Texas, proposes to authorize the licensing of individuals to practice "Dieto-therapy" by an examining board consisting of "three of the teachers of Dieto-therapy, in the state chartered Texas School of Dieto-therapy, chosen among themselves." The bill further states "For the purposes of this act, Dieto-therapy is the practice of restoring health to humans by the means of trained guidance in the proper use of: air, in controlled breathing to some extent; water, used in proper moderation internally and externally; common foods, as are sold in any well stocked grocery, used in compatible combinations, with no patented or processed foods being required; sunshine, taken in exposures to aid metabolism, yet supervised to prevent deep burns; exercise to aid circulation, yet not to the point of exhaustion of nervous energy; rest, for recuperative purposes, yet never to the point of stagnation; and training in mental control, recognizing that the mind and the body are unalterably linked together. The teaching of how to combine these seven natural qualities for the health-aid of any human shall constitute, and is, the teachings of Dieto-therapy. The graduate who teaches this method of health-aid to any person shall be entitled to the title of Dietopath, and may charge for his teachings or services."

Another state, Illinois, through H.354 proposes to enact a separate physiotherapy practice act and to authorize the examining of applicants for a license to practice physiotherapy. The bill defines the practice of physiotherapy as "treating the human body . . . by the use of such adjuncts as light, heat, air, water, diet, gymnastics and electricity." Applicants must be graduates of an accredited high school.

Report of the Forsyth Dental Infirmary for Children for 1941. This 26th annual report comments as follows on the work of the Nutrition Department of which Ruth L. White is chief, assisted by C. Irene Goodhue: "Diets and habits of individual patients are studied in this department and regulatory advice is given. The results of these corrective suggestions have proved most striking and effective from a general preventive standpoint, both in regard to the teeth and to the body as a whole."

The work of the Infirmary includes the training of dental interns who receive lectures in nutrition by Dr. George R. Minot on "Dietary Deficiency Disease"; Miss White on "Nutrition"; and Mark D. Elliott, D.D.S., on "Retardation of Caries by Nutrition."

A total of 6744 children were registered in the Infirmary for the year 1940, of which 1035 cases were referred to the Nutrition Department for conferences.

A Symposium on the Respiratory Enzymes and the Biological Action of the Vitamins has been arranged jointly by the University of Wisconsin and the University of Chicago, for September 11–17. The first sessions will be devoted largely to the respiratory enzymes and will be held on the University of Wisconsin campus. From September 15–17 the sessions will be devoted to the vitamins. The program includes the following: "Intermediary Carbohydrate Metabolism", Otto Meyerhof; "Oxidases, Peroxidases and Catalase", K. G. Stern; "Metabolic Cycles and Decarboxylation", E. A. Evans, Jr.; "Vitamin B_1 (Clinical)", Norman Jolliffe; "Riboflavin", P. György; "Riboflavin (Clinical)", W. H. Sebrell; "Nicotinic Acid", C. A. Elvehjem; "Nicotinic Acid (Clinical)", D. T. Smith; "Vitamin B_6", S. Lepkovsky; "Multiple Deficiencies", T. Spies; "Pantothenic Acid", R. J. Williams; "Biotin", V. du Vigneaud; "Vitamin K", D. W. MacCorquodale; "Vitamin K (Clinical)", H. P. Smith and E. D. Warner. Reservations for meals and lodgings at $3.50 per day can be made either with T. R. Hogness, Department of Chemistry, University of Chicago, or with Van R. Potter, McArdle Memorial Laboratory, University of Wisconsin.

Ohio Nutrition Defense Committee. During April and the early part of May, nutrition institutes are being held in seven areas of Ohio, namely: Cleveland, Columbus, Dayton,

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GET FLAVOR-APPEAL INTO EVERY MEAL
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Youngstown, Athens, Bellefontaine, and Bowling Green. The 88 counties in Ohio have been allocated to these different area institutes. Programs lasting one full day will be planned for the following groups from the surrounding counties: physicians, dentists and nurses; dietitians, nutritionists and home economists employed in various capacities; staffs of agricultural extension services and of farm security administrations; staffs of city and county health departments; school administrators and teachers; and social workers consisting of relief directors, those directing bureaus of aid to dependent children, child welfare, etc. According to Dr. Martha Koehne, Bureau of Child Hygiene, Department of Health, Columbus, it is hoped in this way to reach the various individuals whose work brings them in contact with the nutrition problems of their respective communities.

Planning committees in these areas will be authorized to charge a registration fee not to exceed 50 cents per person. Each state and federal agency having agents in these positions will turn in 12 sets of any pamphlets that can be distributed at these institutes and a list of exhibit material that may be loaned. Each area chairman will then be sent a complete set in time so that he may send for what he will need for his institute. Dr. Koehne is chairman of the subcommittee in charge of the institutes.

Vitamin C Content of South American Foods. Nelly Armand Ugon of the Department of Nutrition, Ministry of Public Health, Montevideo, Uruguay, has published a report entitled "Vitamina C En Las Conservas Del Uruguay", in the *Archivos de la Sociedad de Biologia de Montevideo.*

Dr. Helen S. Mitchell Receives New Appointment. Dr. Mitchell, who is secretary of the Committee on Food and Nutrition and member of the Food Habits Committee of the National Research Council, has recently also been named Director of Nutrition on the staff of Paul V. McNutt, Coordinator of Health, Welfare and Related Defense Activities, Washington. Margery Vaughn, nutritionist on the staff of the New York State Department of Health, will assist Dr. Mitchell under the title of Assistant Director of Nutrition. Dr. Russell M. Wilder is chairman of the Committee on Food and Nutrition of the National Research Council. Members of this committee who are also members of the American Dietetic Association include Drs. James S. McLester, H. C. Sherman, E. V. McCollum and Lydia J. Roberts, and Grace Bulman.

Mary Barber Speaks Before the HEWIBS. On April 3 at a dinner meeting of the Home Economics Women in Business at the Hotel New Yorker, New York, Miss Barber, Director of the Home Economics Department, Kellogg Company, President of the American Dietetic Association and Food Consultant for the United States Army, spoke on "Three Million Meals a Day" to an audience of more than 500 people. Other speakers included Dr. Helen Judy Bond, head of Department of Household Arts and Sciences, Teachers College, and Eloise Davison, director, *Herald Tribune* Home Institute. Miss Barber, introduced by Lt. Col. Paul P. Logan, chief of the Subsistence Branch, Office of the Quartermaster General, traced the changes in the Army ration through successive wars. She was assisted in illustrating the contrast in these rations by seven young soldiers from Fort Slocum, dressed in uniforms of the wars of 1776, 1812, 1848, 1861, 1898, 1917, and the present uniform worn by men in the U. S. Army. Today's army, Miss Barber said, is better fed than at least 60 per cent of the people in the United States and is believed to be the best fed army in the world.

Sir Frederick Grant Banting, co-discoverer of insulin and co-winner of the Nobel Prize in medicine in 1923, was killed, February 21, in an airplane accident on Newfoundland's east coast on his way to England. At the very moment of his death he was en route to England to convey, it is reported, the results of recent research of military significance.

Charlotte Munch. According to the Erie, Pennsylvania, *Dispatch-Herald* for February 13, Charlotte Munch, dietitian at St. Thomas' Hospital, Akron, Ohio, died February 12 from a streptococcus infection in St. Vincent's Hospital after an illness of three months. Miss Munch, a member of the American Dietetic Association, received her B.S. degree in home economics from Villa Maria College in 1937. She served her internship at the Polyclinic Hospital in New York and after a year at Spencer Hospital in

The Newer Concepts of Meat in Nutrition

Meat...

As a Factor in the Prevention of Certain Vitamin Deficiencies

THE recognition of subclinical manifestations of vitamin deficiency states has led to the realization that the incidence of hypovitaminosis, especially deficiency of the components of the B complex, is considerably greater than heretofore believed. Since in the absence of other contributing factors a poorly planned dietary alone can be the cause, physicians and nutritionists are agreed that prevention of such deficiencies is a matter of adjusting the dietary to include adequate amounts of foods rich in the vitamins needed.

In the prevention and correction of thiamine, riboflavin, and/or P-P factor deficiencies, meat is gaining increasing consideration.

As early as 1924, long before the recognition and isolation of B complex components, Hoagland[1] showed the high content of "vitamin B" in pork muscle. Today pork is recognized as one of the excellent sources of thiamine.[2] Virtually all other meats are good sources of this vitamin.

Recently it has been demonstrated that meat also is rich in riboflavin[3] and nicotinic acid. Hence the dietary providing ample amounts of meat each day may be expected to aid materially in preventing deficiency syndromes attributable to the lack of these important B complex vitamins.

1. Hoagland, R.: Antineuritic Effect of Hog Muscle, Am. J. Physiol. *67*:300, 1924.
2. Mickelsen, O.; Waisman, H. A., and Elvehjem, C. A.: Recent Studies on the Vitamin Content of Meat and Meat Products, J. Am. Dietet. A. *15*:529 (Aug.-Sept.) 1939.
3. Mickelsen, Olaf; Waisman, H. A., and Elvehjem, C. A.: The Distribution of Riboflavin in Meat and Meat Products, J. Nutrition *18*:517 (Nov. 10) 1939.

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American Meat Institute
CHICAGO

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Meadville, she was appointed administrative dietitian at St. Thomas' Hospital.

Dietitians of Illinois State Institutions Meet. Dietitians in the Illinois state institutions met at Champaign March 7 jointly with the Illinois Dietetic Association. It is now planned to have a meeting of all dietitians employed in state institutions every six months. Hannora Hammel has been appointed chairman of the group and Lois Fruin, secretary. A committee of three has been appointed to standardize recipes for use in all state institutions and it is hoped that within six months a complete set of standardized recipes will be available. Mrs. Christine Pensinger, food and textile adviser, gave a comprehensive account of the year's accomplishments, followed by reports on: methods of reducing unnecessary food waste, Edith Tilton Aitken; suggestions for establishing training schools for dietary employees, Mrs. Pensinger; problems in preparing food quarterlies, Howarda Van Sickle and Vera Armin; methods of reducing garbage at Manteno State Hospital, Arla P. Coates; method of handling laundry for employees and patients in dietary departments, Doris Lemke; difficulty in securing patient workers, Ceora Roberts; feeding of all employees in main dining room, Leocadia August; how to ensure prompt food deliveries and reporting of complaints, Laura Pahmeier; feeding working patients, Ruth Kiest; how to obtain variety in patients' menu, Grace L. Hopper; and suggestions for improving food specifications, Hildur Hellberg.

Manteno State Hospital Appointments. On January 1 five dietitians were added to the staff of the dietary department at Manteno State Hospital, Illinois. This means that there is one dietitian for every 1000 persons served at the institution. The new appointees, under the supervision of Mrs. Arla P. Coates, chief dietitian, are as follows: Wilma Chamberlain, Mrs. Ceora Roberts, Ruth Burcham, Doris Lemke and Vivian Doak. With these appointments it is believed that the dietary department at Manteno will be able to operate as efficiently as the dietary department of any mental hospital in the country.

A Conference of Dietitians, sponsored by the Illinois, Indiana and Wisconsin Dietetic Associations, is being held in Chicago, May 8-9 at the Stevens Hotel. The program includes a symposium on "How Can the Nutritional Condition of the General Populace be Improved?" led by Mary I. Barber, President, A. D. A., in which discussions are to be presented from the standpoint of: "The Infant Welfare Worker", Mabel Stimpson, Infant Welfare Society of Chicago; "The Public Health Nutritionist", Leone Pazourek, Illinois State Department of Public Health; "The Hospital Dietitian", Zella Kester, Indianapolis City Hospital; "The College Professor", Harriet Barto, University of Illinois; "The Commercial Nutritionist", Ethel Austin Martin, National Dairy Council, Chicago; and "The Dietitian in the Public Institution", Ada B. Lothe, Milwaukee County Institutions. In the afternoon, business sessions of the Illinois, Indiana, and Wisconsin Dietetic Associations are to be held.

The program on May 9 includes a luncheon at the Milwaukee County Hospital and the following discussions: "Australian Trifle", Edith Tilton Aitken, Works Project Administration, Springfield, Illinois; "Teaching Nutrition to Student Nurses", Anna M. Light, Indiana University Medical Center; "Dietary Factors in Anemias", Dr. Raphael Isaacs, Department of Hematology, Michael Reese Hospital; and "Experiences of an Army Dietitian", Miss Haight, dietitian, Chanute Field Hospital. Presiding officers include Mildred Bonnell, University of Illinois, Ethel Keating, Milwaukee County Hospital, and Dr. Cecilia Schuck School of Home Economics, Purdue University.

Alabama Dietetic Association held its February meeting at the University of Alabama. At a luncheon given by the state president, Mrs. Ina B. Crane, at Tutwiler Hall, Dean Agnes E. Harris introduced the following guest speakers: Dr. Mildred Englebretch, professor of chemistry, University of Alabama, "The Effect of Food on Intestinal Flora"; Dr. R. D. Pomeroy, professor of biology, University of Alabama, "Visual Education in Relation to Nutritional Problems in National Defense." At the business meeting which followed, Mrs. Crane was elected representative to the national House of Delegates. Mrs. Crane asked members to register for the national defense program and registration cards were filled out by all. Plans were discussed for the spring meeting which was to be held in Birmingham in April.

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Mrs. Lona A. Jones, former state president and previously dietitian at Norwood Hospital, Birmingham, has accepted a position at Memorial Hospital, Cumberland.

Mrs. Lillian Williams, formerly of Grace Hospital, Cleveland, is now dietitian at Norwood Hospital.

Martha Keith, from the Holy Name of Jesus Hospital, Gadsden, is at Highland Baptist Hospital, Birmingham.

Betty Costello, formerly dietitian at the Ohio Valley Hospital, is now at the Army Hospital, Fort McClellan, Anniston.

Florida Dietetic Association. Among the Florida dietitians now in Army cantonments are the following: Katherine Sands, chief dietitian, Station Hospital, Camp Blanding, Florida; Margaret Stout, formerly at the State Tuberculosis Sanatorium, now at Fort Bragg, North Carolina; and Lucille Dale, recently at New York Hospital, now at Maxwell Field, Alabama.

Dr. Jennie Tilt, Florida House of Delegates representative, has completed the registration of Florida dietitians as directed by the A. D. A.

As a part of the Faculty Forum on Careers, Anna M. Tracy on December 16 discussed "Dietetics as a Profession" over WTAL.

Anna Mae Sikes, extension nutritionist, Agricultural Extension Service, received the M.S. degree on January 25 from Florida State College for Women. Her thesis was titled "A Study of Health Practices and Conditions with Special Reference to Food and Food Habits in Eight Northwest Florida School Communities."

Mary Lois Gill, assistant dietitian, Dining Hall, Florida State College for Women, resigned January 1 to accept a position as chief dietitian, Touro Infirmary, New Orleans. Edith Manford, formerly of Johns Hopkins Hospital, was appointed to the dietary staff, Dining Hall, F.S.C.W., in January.

The Executive Committee of the Florida State Agricultural Land Use Planning Committee has appointed six subcommittees to deal with the most important phases of agriculture and problems of farm people in Florida—those phases where adjustment is believed to be particularly needed in the light of the present emergency situation. One of the subcommittees appointed is a nutrition committee, the personnel of which is made up of a representative from the State Board of Health, Farm Security Administration, Rural Electrification, Home Economics Research, and the Agricultural Extension Service.

Kansas Dietetic Association held its annual meeting March 21 at the Muehlebach Hotel, Kansas City, Missouri. Presiding officers included Dr. Martha S. Pittman, Hermina Zipple, and Mrs. Bessie Brooks West. The program included the following:

Greetings, Hermina Zipple, president, Kansas Dietetic Association.

Developments Regarding Adequate Mineral Content in the Daily Diet, Dr. Clark Krieger, research associate, Wisconsin Alumni Research Foundation.

Allergies, Dr. Orval R. Withers, associate professor of medicine, School of Medicine, University of Kansas Hospital.

Cafeteria Service in Hospitals, Mary M. Harrington, director of dietetics, Harper Hospital, Detroit.

A Symposium on The Place of Nutrition in the National Defense Program: Dr. E. H. Hashinger, professor of medicine, School of Medicine, University of Kansas; Melva B. Bakkie, nutrition consultant, American Red Cross, Washington, D. C.; Mary M. Harrington; Mary Smull, Department of Institutional Management, Kansas State College, Manhattan.

Maryland Dietetic Association. Several members attended the February meeting of the Restaurant Association, Baltimore. Grace E. Smith, president of the national restaurant association, discussed the present educational program for restaurant operators and employees.

At the March meeting S. Margaret Gillam of New York Hospital spoke on "The Pay Cafeteria."

The Community Education Section, Alice Janè, chairman, has sent out another publication to the rural schools entitled "Ordering and Buying." Catherine Leamy, nutritionist with the State Department of Health, reported that these bulletins have been very helpful.

The Administration Section has held two meetings recently. The first was a recipe buffet "tasting bee" at the Church Home and Infirmary with Anne Merkle, one of the committee members, as hostess. Attendance was limited to those who sent in recipes. These were called for a week in advance and gone over with the idea of selecting a variety of dishes which when assembled would be suitable for a supper. Fourteen people were asked to bring samples for tasting sufficient for twenty persons. All

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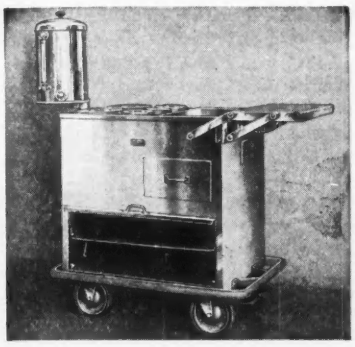

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Reducing Sugars	26.0	3.5
Sucrose	31.3	4.3
Carbohydrate (by difference)	63.3	8.6
Citric acid	6.5	0.85
Calories	2.67 per gm. 76. per oz.	.03 per gm. 10. per oz.

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recipes were mimeographed and distributed to those present. Following the supper there was a round-table discussion of recipes and recipe books.

The second meeting was at Fort Meade with Mary Eustace, dietitian at Station Hospital, as hostess. Miss Eustace, Captain Kearney, commandant at the fort, and Captain Brady arranged for a tour of the Bakers and Cooks School, set up a display of Army rations, and gave most interesting talks on the different Army rations, how the menus are planned, and the care given to the food for soldiers.

Helen Schmit, president of the association, was a guest of the Philadelphia Dietetic Association at their annual dinner March 11.

The association was invited to attend the twentieth anniversary dinner of the District of Columbia Dietetic Association, March 18. Those attending from Maryland were Helen Schmit, Alma Bering, Mary Easton, and Pearl Jackson.

Melva B. Bakkie, nutrition consultant, American Red Cross, was in Baltimore recently assisting the local committee in organizing the canteen for emergency feeding in Baltimore. About twenty members of the association have volunteered to work on this committee. Mrs. Alice Lambert, nutritionist, Baltimore Chapter, American Red Cross, has been appointed chairman of the Canteen Committee of the Maryland Dietetic Association.

As part of the expansion program of the Department of Dietetics at St. Agnes' Hospital, Baltimore, Sister Mary Elizabeth, Order of the Sisters of Charity, has been placed in charge of the department. Sister Mary Elizabeth received her training at St. Joseph's College, Emmitsburg, and has since served at St. Mary's Hospital, Detroit, and St. Leo's Hospital, Greensboro, North Carolina. Plans for St. Agnes' Hospital include a new nutrition laboratory. All aspects of the work of the dietitian will be taught. The courses will be open to college students and credits will be given for work completed. Sister Mary Elizabeth was recently introduced to members of the Maryland Dietetic Association at a tea and reception given at the University of Maryland Hospital.

Norma Pandorff Gregory has been appointed chief dietitian at Sinai Hospital, Baltimore.

Helen McSweeney is now assistant ward dietitian at the Johns Hopkins Hospital.

Florence Critz has accepted a position as supervisor in the Dietetic Department, Union Memorial Hospital, Baltimore.

Mary Manning is now in charge of the Dietary Department at Bon Secours Hospital, Baltimore.

Louise Flore, formerly of the Baltimore City Hospital, has been appointed dietitian at the Central Louisiana State Hospital, Pineville.

Grace Levis, Johns Hopkins Hospital student, class of 1940, is now with the Baltimore Public School Cafeterias.

Mrs. Leonard J. Yuska has accepted an appointment in the Dietetic Department, Union Memorial Hospital.

Massachusetts Dietetic Association. The March meeting was held at the Women's Educational and Industrial Union, Boston. Mr. Raymond A. Fitzgerald, supervisor of research and statistics and interpreter of school law, spoke on "Legal Aspects of the School Lunch and other Institutions." The meeting was preceded by a dinner given in honor of Charlotte Raymond, formerly nutritionist in Newton, now dietitian with the Harvard Hospital Unit in England. Miss Raymond sailed March 8 with other members of the staff on the American Export Lines for Lisbon. From Lisbon they were to fly to their destination in England.

Jean Schwartz, Massachusetts General Hospital graduate, is now head dietitian at the Desert Sanatorium, Tucson.

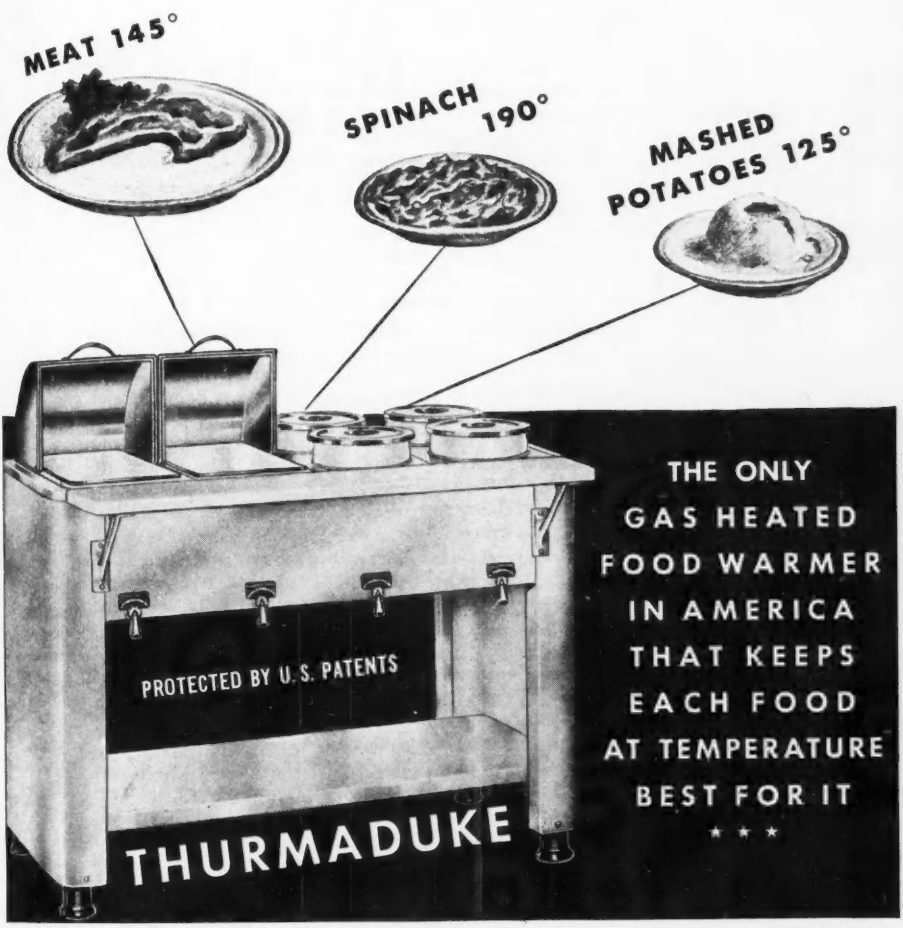
Nellie Burns, formerly dietitian at the Pratt Diagnostic Hospital, is now at Framingham Union Hospital, Framingham.

A round-table meeting to discuss management of dietary departments was held by the Administrative Section of the Massachusetts Memorial Hospital, March 18.

Claudia Stallworth, recent graduate of Peter Bent Brigham Hospital, has accepted a position as dietitian at the South Highlands Infirmary, Birmingham, Alabama.

Mrs. William Riser has resigned as dietitian at the Massachusetts Women's Hospital and is joining her husband, Lieutenant Riser, in Alabama. Margaret Knowles, assistant dietitian at the Robert Breck Brigham Hospital, is replacing Mrs. Riser.

New Jersey Dietetic Association. The annual party was held March 17 at the Orange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Memorial Hospital with Miss Trapp and her assistants as hostesses. The entertainment was in the nature of a "gay eighties" school holiday, with singing, gymnastics and an old-fashioned spelling bee, the prize for the latter being won by Mrs. Ketchum. During supper, Vesta Ilsley, a student of the New Jersey Cooperative Course, entertained with songs. A miniature schoolhouse was auctioned off and the proceeds donated to the Mobile Kitchen Fund.

An Executive Committee meeting preceded by a buffet supper was held at the home of Mrs. Asta Low Packard on March 24 and final plans made for the spring meeting in April.

Greater New York Dietetic Association invited members of the Greater New York Southeastern District Home Economics Association to attend the March 11 dinner meeting at Schrafft's 57th St. restaurant, New York. A total of 175 attended the dinner. Dr. Helen S. Mitchell, who is on temporary and part-time leave in Washington, D. C., working on projects and committees concerned with the national nutrition program in its relation to the nutrition of the entire civilian population, spoke on "The Place of Nutrition in the Defense Program." Dietitians in New York have been busy attending other luncheons and dinners featuring speakers from government departments discussing women's place in defense programs.

On March 13, General Foods Corporation entertained food editors at a luncheon at the Waldorf-Astoria hotel at which Mr. Edwin T. Gibson, president of Frosted Foods Sales Corporation, presided. Henderika Rynbergen, president of the New York State Dietetic Association; Dorothy Stephens, president of the Greater New York Dietetic Association; and Eleanora Sense, chairman of Press Relations for the American Dietetic Association, were among those in attendance.

On March 15, a luncheon was given at the Hotel Biltmore inaugurating the Volunteer Service Bureau of the College and University Women's Center. The program, "Women in National Defense", included as speakers Newbold Morris, president of the New York City Council; Mrs. Florence Kerr of the WPA, Washington, D. C.; Lord Marley, deputy speaker, House of Lords; and Baron Stefan Ropp, director of Polish Information. Lenna F. Cooper, chairman of the A. D. A. Defense Committee, and Eleanora Sense, chairman of Press Relations, attended.

At the Rural and Urban Forum conducted by the New York State Federation of Women's Clubs, Cornell University, Ithaca, March 14–15, Eleanora Sense, editor of the *Bulletin* of the New York State Dietetic Association, was a luncheon speaker. Miss Sense spoke on "Nutrition Notes in the Defense Program", relating how dietitians are cooperating with organizations by serving as nutrition teachers in club programs.

New York State Dietetic Association. At the annual convention at the Hotel Statler, Buffalo, May 1–2, the theme of the program is "National Defense", covering community education, surplus food problems and newer trends in nutrition. The afternoon of May 2 is devoted to a panel discussion of the defense problem with the following representatives of specific fields participating: Gladys Crain, Visiting Nurse Association, Buffalo; Ethel Coan, Buffalo Home Economics Association; Blanche Bohach, Rochester Dietetic Association; Lenna Cooper, hospital dietitian, New York; Mame T. Porter, home economist in social work, Albany; and Mary Switzer, home economist in extension work, Buffalo.

Hudson Valley Dietetic Association met March 3 at the Memorial Hospital, Albany. Dr. John B. Horner, chief urologist, Memorial Hospital, spoke on "The High Vitamin A-Acid-Ash Diet." Mame Porter, president of the Association, has recently been speaking in New York City on "Institution Food Problems." Members of the nutrition staff of the State Health Department have been participating in various county defense preparedness organization meetings.

The Buffalo Dietetic Association met in March at the Edward J. Meyer Memorial Hospital with Mrs. Schaefer of the Adam Meldrum & Anderson's Department Store as guest speaker.

The Clapp Baby Food Company entertained the Rochester Dietetic Association on March 17. Dr. R. A. Reinecke gave an informal talk on production and retailing of the firm's products.

Margery Vaughn and Jessie Cole have just completed a two months program on community nutrition in Yonkers, estimated to have reached over 50,000 people. The work was filmed by

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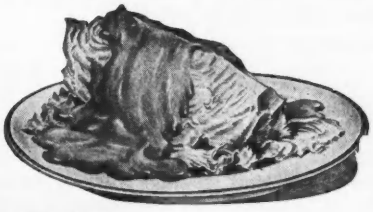

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the State Department of Health and will be made into a picture later.

Dorothy Stephens, chief dietitian, New York Post-Graduate Hospital, has been appointed to the Women's Council of the Greater New York Fund. Under Theresa Helburn, chairman, the Women's Council will assist in raising money for this worthy enterprise.

North Carolina Dietetic Association. Jane Womble is studying at the Vaughn Graham Clinic, Richmond, Virginia, working on diets in the treatment of allergy.

Sara Boyd Pickett, formerly dietitian at the Baptist Hospital, Winston-Salem, is now at the Station Hospital, Fort Bragg, in charge of Mess 2 of the new hospital unit.

Margaret Edwards, head of the Home Economics Department of the Woman's College, has been appointed to the State Defense Council to represent the state association.

Elizabeth O. Meinung has been appointed a member of the national committee to prepare an outline on ethical procedure for dietitians.

Winifred Riley, formerly of Grace Hospital, New Haven, Connecticut, is now assistant dietitian at Duke University Hospital, replacing Mary Wilkinson who has returned to her former position in Oklahoma City.

Emma Jane Beydler, graduate of Madison College and the Medical College of Virginia, is assistant dietitian at the City Memorial Hospital in Winston-Salem.

Josephine Lynn has left the Long Hospital and is now located at the Mooresville Hospital. Elizabeth Sherrill, recent graduate of the Woman's College, replaces Miss Lynn at Long Hospital.

Mrs. Flora W. Edwards talked on "The Family Food" in the Modern Home-Makers series over WBIG, Greensboro; Jane Umstead, on "Milk as a Basic Food Throughout Life"; and Blanche Tansil, on "A Balanced Diet Through Home Produced Food" during February over the same station in the City Health Department weekly series.

The Home Economics Cafeteria of the Woman's College has installed six new pieces of fabricated equipment of stainless steel and a new range. It is now one of the better equipped kitchens of the state. This food center is operated solely for the training of institution management majors.

Joan Duncan, dietitian of the Kate Bittings Reynolds Memorial Hospital, Winston-Salem, has accepted a position with the Charlotte Memorial Hospital. Mary Jane Beckerdite, assistant, has taken over her work and Beth Byers, graduate of the Watts Hospital course, is the newly appointed assistant.

Annie Lee Whitesides, formerly dietitian at the Thompson Memorial Hospital, Lumberton, was married to Mr. Gordon J. Poteat and is now living in Laurinburg.

Isabelle Mosely, dairy marketing specialist, was married in December to Mr. Paul L. Fletcher of Raleigh, senior marketing specialist for the North Carolina State Department of Agriculture.

Virginia Taylor, graduate of the Watts Hospital course, was married in December to Ensign C. R. Calhoun at Grace Episcopal Church, Charleston, South Carolina. Mrs. Calhoun is assistant dietitian at Roper Hospital in Charleston.

Lucy Lisenby, a graduate of Alabama Polytechnic Institute and the hospital course of the Medical College of Virginia, is now dietitian at Pitt Community Hospital, Greenville.

Mrs. D. N. McFarland, formerly food director of Hylton Hall, Schoolfield, Virginia, has been appointed junior hostess at the Service Club of the Ninth Field Artillery Service, Fort Bragg.

Myra Binford, formerly of Brevard College, is now superintendent of a girls' home in Jamaica.

Berdine Chartier, formerly of Appalachian Teachers College, Boone, is in charge of food service at the Gordon Crowell Memorial Hospital, Lincolnton, North Carolina.

Mrs. Hervey Ferris is now in charge of the food service at the new Harnett County Hospital, Dunn.

Mrs. Rowena S. Carpenter of the Bureau of Home Economics spoke at the annual meeting of the Nursing Council in Greensboro, February 11, on "Nutrition in Relation to Physical Fitness." Afterwards she visited the nutrition experimental center that the Rockefeller Foundation is sponsoring at Bynum with the State Health Department.

The association met on April 25-26 at the Woman's College of the University of North Carolina, Greensboro. The theme of the program was "Adequate Nutrition for All."

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The following committees served: general chairman, Mabel Swanson; program, Margaret Edwards; registration, Sara Lee Cassell; hospitality, Mrs. Flora W. Edwards; exhibits, Rachel Moser; publicity, Blanche Tansil. Mary I. Barber, President of the American Dietetic Association, was the luncheon speaker. A feature on the program was a symposium on nutrition studies within the state.

The *Bulletin* of the North Carolina Dietetic Association, with Blanche Tansil of the Woman's College as editor, is now being published bimonthly. Other state editors are asked to place their names on the mailing list.

Northwest Dietetic Association held its annual spring meeting at Washington State College Campus April 6-8. Plans for the first day included a special drive around the college grounds and a trip to the University of Idaho, where the Home Economics Department served a Sunday night supper. The theme of the program for Monday was "Nutrition and National Defense" and for Tuesday, "Recent Advances." Gladys E. Hall, educational director, A. D. A., was the speaker at the annual banquet, and her subject, "The Role of the A. D. A. in the Defense Program."

Ohio Dietetic Association. The spring meeting was held jointly with the Ohio Hospital Association, April 29-May 1, Columbus. The guest speaker at this twentieth annual meeting was Margaret Cowden, treasurer and chairman of the Finance Committee, American Dietetic Association.

Members of the Defense Committee of the state association are: Elizabeth Perry, chairman, Cleveland; Dr. Martha Koehne, Columbus; Helen Hunscher and Marie Hines, Cleveland; Inistore Simms, Youngstown; Eleanor Maclay and Eva Ylvisaker, Cincinnati; and Alta Hirsch, Dayton.

The association had two bulletins on display at the Cleveland Food and Home Show, March 6-13, the Food Facts and Fallacies Committee contributing "For Good Health Build Your Meals Around These Foods." "The Family's Food" was contributed by the Nutrition Committee Welfare Federation.

Mrs. Alice Smith, Ohio community education chairman, is giving simple nutrition instruction to four groups of mothers in two housing projects in Cleveland.

Volunteer teachers from the dietetic and home economics groups are giving a refresher course to teachers in Cleveland.

A subcommittee of the Ohio Nutrition Defense Committee, headed by Dr. Martha Koehne, will advise and aid local committees in seven areas in Ohio in conducting district institutes of nutrition. An institute was held in Columbus on April 21 and one is to be held in Dayton on May 14.

Mrs. Ethel Martin, National Dairy Council, spoke on "Highlights in Nutrition News" at the February meeting of the Cincinnati association.

Cincinnati dietitians and nutritionists taking part in the "Institute on Women and the National Defense" in Cincinnati, January 29, included Catherine Koch, Children's Convalescent Home; Betty Jane Herschede, Catholic Charities; Mollie Kallar Claybon, school lunch, University School. The program was developed by Eleanor Maclay. Dr. Martha Koehne was guest speaker.

Elizabeth Piper, formerly of Baltimore, is now assistant dietitian at Holmes Hospital in charge of the University of Cincinnati Medical College cafeteria.

Isabel Jones, formerly of Jewish Hospital, Cincinnati, is now at Stouder Memorial Hospital, Troy, Ohio.

Alice McKenney and Estella Krolfifer have taken newly created positions as ward dietitians at Hamilton County Tuberculosis Sanatorium, Cincinnati.

Jean Grant, dietitian for Dr. Tom Spies, reported on her work in Birmingham at the January meeting at Holmes Hospital. Dr. Virgil Hanenstein, professor of internal medicine at the University of Cincinnati Medical School, reported on recent experiments in hypertension.

Christ Hospital lists the following student dietitians for 1940-41: Ruth Otness, University of Minnesota; Doris Mauntler, Ohio State University; Ellen Benson, University of Wisconsin; Mary Ellen Looney, University of Cincinnati; Helen Johnson, North Dakota State University; and Helen Christman, Miami University. A report on the student dietitians in the 1939-40 class includes the following information: Virginia Roberson is now dietitian at Jewish Hospital, Louisville, Kentucky;

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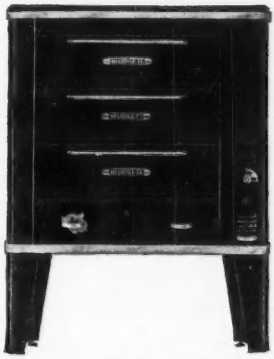

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Althea Lloyd, Mahoning Tuberculosis Sanatorium, Youngstown, Ohio; Carolyn Sullivan, St. John's Hospital, Anderson, Indiana; Mary Jane Braly, St. Joseph's Hospital. Louisville, Kentucky; Gladys Keefer was married to Mr. Lloyd Lauffer in November; and Wilma Chamberlin is now dietitian at Anna State Hospital, Anna, Illinois.

Ethel Jones, formerly on the staff at Indiana University Medical Center, Indianapolis, is now administrative dietitian at Christ Hospital.

A three to five-day "refresher course" for dietitians, nutritionists and home economists on the Ohio University campus is contemplated during the summer of 1941, similar to that held by Cornell University for several years.

A special committee has been appointed to draw up a plan by which it is hoped nutrition service will be available to college students as part of their health service.

Marie Hines is the official representative of the state dietetic association on the Ohio Nutrition Defense Committee.

On April 25 Dayton Dietetic Association presented a program on modern nutrition designed to show what opportunities for improved nutritional health are afforded individuals in the community. With Verna Miller, president, presiding, the subject of "Nutrition in the Home" was discussed by Eleanor Maclay, professor of nutrition, University of Cincinnati, speaking on "Nutrition in Family Life Today and Tomorrow", and Katharine Fisher, director, Good Housekeeping Institute, New York, "Our American Trends in Food."

"The Problem of Child Nutrition: The School and the Home" with Mr. Emerson Landis, superintendent of schools, Dayton, presiding, was discussed by Dr. Martha Koehne, Ohio state nutritionist, speaking on "Nutrition and Child Health", and Melva Bakkie, nutrition consultant, American Red Cross, "The Child's Nutritional Health in a National Emergency."

The evening session at which Alta Hirsch, director, Department of Nutrition, Miami Valley Hospital, presided, comprised discussions on "Coordination of Effort in the Nutrition Program" presented under the following subtitles: "Nutrition in Public Health Administration", Dr. H. H. Williams, health commissioner, Dayton; "Nutrition Education in the Modern Hospital", Mr. Albert Scheidt, administrator, Miami Valley Hospital; and "The Dietitian in a National Emergency", Mary M. Harrington, director of nutrition, Harper Hospital, Detroit.

A symposium followed in which specialists in the fields of nutrition, medicine and dentistry participated. Speakers here included Miss Harrington and Dr. Koehne.

Oklahoma Dietetic Association. The annual meeting was held at the Skirvin Hotel, Oklahoma City, April 25–26. The theme of the convention was "Nutrition in National Defense". The program follows:

The State Nutrition Program for National Defense, Dr. Gladys M. Kinsman, associate professor of household science, Oklahoma A. & M. College, Stillwater.

Nutrition and National Defense, Open Meeting.

Administration, Nell Clausen, chairman of House of Delegates, A. D. A.

The Newer Knowledge of Vitamins, Dr. Mark Everett, professor of biochemistry, Oklahoma University Medical School.

The Psychology of Eating, Dr. Coyne Campbell, professor of psychology, Oklahoma University Medical School.

How to Make Your Own Food Models, Laura Miller, Department of Home Economics, Oklahoma University.

Do You Know Your National Association? Mrs. Bessie Brooks West, Department of Institutional Management, Kansas State College.

Visual Aids in Teaching, Dr. Haskel Pruit, associate professor of education, Oklahoma A. & M. College.

Facts the Dietitian Should Know About a New Story, Mr. Sam Whitlow, associate professor of journalism, Oklahoma A. & M. College.

Nutrition and Health, J. Ernestine Becker, Maternal and Child Health Division, Children's Bureau, Washington, D. C.

Philadelphia Dietetic Association. The association met on February 25 at Jefferson Hospital where Dr. Burgess Gordon, medical director and physician in charge, Department of Diseases of the Chest, presented a paper on "The Practical Aspects of Diet: The Patient and the Institution."

At the short business session Anna Fawcett reported returns of $79 on the annual midyear welfare party.

The annual banquet was held March 11 at the Benjamin Franklin Hotel with Ida Jean Kain, author of *Prescription for Slimming*, and writer for King Features Syndicate, as guest speaker. During her talk on "Dramatizing the Dietitian", Miss Kain emphasized the part dietitians will play in the National Defense Program.

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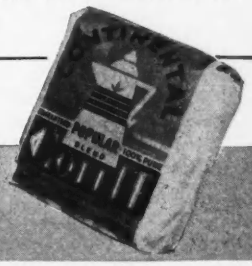

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On March 25, Marjorie M. Heseltine, nutrition consultant, Children's Bureau, Washington, D. C., spoke to the association and guests on "Nutrition and the Health of Mothers and Children." The meeting was held in the Administration Building of the Board of Public Education.

The Pennsylvania Dietetic Association will meet at the Adelphia Hotel, Philadelphia, May 22 24. The theme of the convention will be "Service of the Dietitian to the Community." Besse Howard, radio commentator, will be the guest speaker at the banquet.

At the Sixth Annual Post-Graduate Institute of the Philadelphia County Medical Society, March 31-April 4, the association's Special Diet Committee exhibited a "Low Residue Type Diet."

Dr. Elda Robb, who has been appointed professor of nutrition and director of the Department of Home Economics at Simmons College, Boston, effective September 1941, came to Temple University five years ago from the Child Development Institute, New York. She has had charge of the nutrition work at the university and has been responsible for the development of the graduate program in home economics. Dr. Robb has been very active in nutrition and dietetic work in Philadelphia and the state as president of the Philadelphia Dietetic Association and vice-president of the state association.

Edna Oren, formerly dietitian, Coatesville Hospital, resigned her position and was married on March 15 to Mr. Jack Gainer, Newark, New Jersey.

Miriam Adams has resigned as dietitian at Lankenau Hospital to accept a government position at Fort Meade, Maryland.

Henrietta M. Harter has been appointed assistant dietitian at Jefferson Hospital.

Janette DeBissette Clark is now with Methodist Hospital as assistant dietitian.

Violet Miller, a graduate of Carnegie Institute of Technology and Drexel Institute, is now student dietitian at Philadelphia General Hospital.

Dorothy Halladay, recently at Farnhurst, Delaware, has succeeded Sara O'Connor as metabolic dietitian at Graduate Hospital. Miss O'Connor now has charge of the Dietary Department of St. Barnabas Hospital, Minneapolis.

Frances Clarke has accepted a position as assistant dietitian at Pennsylvania Hospital.

Hannah Herd is now with the public school system in Philadelphia.

Marie Chapman, who has been assistant dietitian at Pennsylvania Hospital for Mental and Nervous Diseases, was married December 1940 to Mr. Jacob S. Fuller. Mr. and Mrs. Fuller are now residing in Memphis. Helen Leary has accepted a position as assistant dietitian at Pennsylvania Hospital.

Dorothy Gretz has replaced Florence Ireland at Presbyterian Hospital. Miss Ireland was married during the Christmas holidays to Dr. Robert Hoy of Cincinnati.

Susan Merrow is with Children's Hospital of Philadelphia, serving as nutritionist in the clinics.

Julia Bell, Germantown Hospital, was married to Mr. Paul Russell Edwards on February 18 in Chicago.

Elizabeth Troxell, formerly of St. Mary's Hospital, is now at Germantown Hospital. Edna Haynes, formerly student dietitian at Hahnemann Hospital, replaces Miss Troxell at St. Mary's.

Northeastern Pennsylvania Dietetic Association. On March 8 members heard Elizabeth Rugh, Veterans Administration Hospital, New York, speak on "An Administrator's Problems."

Mary E. Murray, formerly of the Scranton State Hospital, has accepted a position as chief dietitian at the Hillside Hospital, Clarks Summit. Diana Notarianni has been appointed assistant dietitian at Scranton State.

Margaret Bell, formerly of Hamburg State Hospital, is now head dietitian at the West Side Hospital, Scranton.

Ruth O'Donnell has been appointed dietitian at the Mercy Hospital, Wilkes-Barre.

Sallie Jacobs, dietitian at the Mental Hospital, Retreat, has announced her marriage to Mr. Charles Ruptic.

Mrs. Lucy Johnson, formerly of Johns Hopkins Home for Incurables, Baltimore, is now dietitian and food supervisor of the Hotel Jermyn, Scranton. Mrs. Johnson for five years was an assistant to Dr. E. V. McCollum.

Pittsburgh Dietetic Association. At the monthly meeting March 4 at the Children's

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Hospital, the subject of "Nutrition in National Defense" was discussed by Irene Willson of Shadyside Hospital, a member of the Pennsylvania Nutrition Defense Council. Emma Watts, director of home economics in Allegheny County schools, spoke on "Nutrition Education in the County." Mr. J. Price, special representative of the Federal Surplus Commodities Corporation, and Mr. E. J. Boleky, distribution manager, reported on the Food Stamp Plan and the distribution of surplus commodities in connection with the school lunch program. At the conclusion of the program, Dr. Gomer S. Llewelyn, medical director and superintendent of the Pittsburgh City Home and Hospital, Mayview, showed pictures of the institution.

Grace Jackson, vice-president of the Pittsburgh Dietetic Association, has resigned her position as administrative dietitian at Columbia Hospital. Lucille Simpson has replaced Miss Jackson. Elizabeth Clapp, formerly of Springfield, Massachusetts, is Miss Simpson's assistant.

Sylvia Levie, chief of the Dietary Department of the Pittsburgh City Home and Hospital, Mayview, has been appointed chairman of the Military Status Committee by Florence Peters, president of the Pennsylvania Dietetic Association.

Virginia Lindberg has resigned her position at St. Margaret's Memorial Hospital. Barbara Markham, a former student at the Hahnemann Hospital, Philadelphia, replaces Miss Lindberg.

Nancy Huston, formerly assistant dietitian, Passavant Hospital, is now at St. Luke's Hospital, Cleveland. Dorothy McCormick, who had her student experience at the West Penn Hospital, replaces Miss Huston.

The program of the sectional meeting of the American College of Surgeons, Pittsburgh, March 17–20, included Rena S. Eckman, Montefiore Hospital, who participated in a panel discussion, speaking on food service, and Evelyn H. Weins, administrative dietitian, West Penn Hospital, who discussed public relations from within and without the hospital from the dietitian's point of view.

Two new appointments have been made to the dietary staff of Montefiore Hospital: Dorothy Bremmer comes from the Jewish Memorial Hospital, New York, where she had her student experience; and Jean Root from the McLeod Infirmary, Florence, South Carolina. Miss Root had her student training at Duke University Hospital.

Irene Willson of Shadyside Hospital and Rena Eckman of Montefiore Hospital, according to the Pittsburgh *Press* of March 17, were passengers on the Pittsburgh-bound train which was wrecked near Baden on March 16. Both, however, escaped unharmed and were discharged after treatment for slight injuries and shock.

South Carolina Dietetic Association now includes the following A. D. A. members: Ruth Waller, Conway Hospital, Conway; Elizabeth Yates, Baptist Hospital, Columbia; Mrs. Mildred Meyer, chief dietitian, Veterans Facility, Columbia; Mrs. Virginia Taylor Calhoun, Roper Hospital, Charleston; Helen Fields, Marion Sims Memorial Hospital, Lancaster; Marguerite Whetsel, Toumey Hospital, Sumter; Mrs. Betty Cooke Schofield, Florence; Roberta London, York County Hospital, Rock Hill; Mrs. Stella Kellam, Greenville General Hospital, Greenville; and Nell Cooke, Helen Wilks, Jennie Sopstyle, Thelma Harman and Mary French, all at Station Hospital, Fort Jackson. Miss Fields, previous to her present appointment, was for four years in South America. Mrs. Schofield, formerly assistant to Blanche Tansil at the Woman's College, Greensboro, North Carolina, assisted in the Dietary Department, McLeod Infirmary, for a short time.

Mildred Willis, assistant dietitian at Spartanburg General Hospital for the past four years, is now assistant dietitian at McLeod.

Virginia Insco has returned to South Carolina as dietitian at the Anderson County Hospital.

Texas Dietetic Association. The seventh annual convention was held March 14–15 at the Plaza and Warwick Hotels, Houston. Presiding officers were Azalete R. Little, Mary E. Smith, Selma Streit, Frances Low, and Mamie Ruth Harris. Social activities included a patriotic luncheon, friendship luncheon, formal dinner, Mexican dinner, and a garden club tour.

A panel discussion was conducted by section chairmen, with Katherine Fry, Jonnie McCrery, and Laura McLaughlin participating. Other features on the program included:

Reviewing Current Literature, Grace Sweatt.
Recent Studies on Peanuts in the Diet, Ethel B. Montague.

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Activities of South Texas Dietitians, W. J. Gervers.
Catering to Individual Preferences in Foods, Helen Corbitt.
The Challenge of 1941 to the American Dietetic Association, Nelda Ross.
Obesity, Dr. Haydn H. Cutler.

Ten graduates of Texas Technological College are now supervisors of WPA lunch projects.

Virginia Dietetic Association. At the monthly meeting of the Blue Ridge Dietetic Association, Dr. George McLean Lawson, professor of medicine, University Hospital, Charlottesville, spoke on "Preventive Medicine". Other speakers were Dr. Raymond Uhl, acting director of the Bureau of Public Administration at the University, and Miss Click of the Farm Security Administration.

Doris Woodward, University Commons, Charlottesville, has been elected president; Clara G. Turner, Madison College, Harrisonburg, vice-president; Mary Alice Grantham, University Hospital, Charlottesville, secretary; Sue Raine, Christian College, Lynchburg, treasurer.

The Virginia Home Economics Association and the State Nutrition Conference held a joint meeting at the Roanoke Hotel, Roanoke, February 13–15. Mrs. Bernice Varner was chairman of the program and Mrs. Mary de Garmo Bryan, Dr. Norman Gold, Dr. Hazel Stiebeling and Melva Bakkie were speakers. The theme of the meeting was "Making Virginia Strong by Making Virginia Citizens Stronger."

The Tidewater Dietetic Association met at the General Hospital, Norfolk, Virginia, with Mrs. C. C. Smith reviewing "Parliamentary Procedure".

Louie Forester has accepted a position as assistant dietitian, General Hospital, Norfolk.

Frances McBeath is conducting classes in cooking for the Girl Scouts and Bertha Ide is examining the same group for awards of food and hostess badges.

Janet Turnbull has accepted a position as dietitian at Leigh Memorial, Norfolk. Miss Turnbull was formerly dietitian at Bright Look Hospital, St. Johnsberry, Vermont.

Eleanor Carr, formerly of Leigh Memorial, has been appointed dietitian at Langley Field.

The March meeting of the Richmond Dietetic Association was held at the Medical College of Virginia. The student dietitians of the college presented a play and special committees were appointed to help with the plans for the state convention in April.

Bertha Jenkins, dietitian, Richmond Dairy, and president of the Richmond Dietetic Association, was married on April 5 to Mr. Charles Jones Watson.

Margaret Bock has accepted a position as assistant dietitian at Mary Washington College, Fredericksburg, Virginia.

Margaret McDonald resigned her position at St. Luke's Hospital, Richmond, and has been succeeded by Eleanor Wolfe as chief dietitian. Annie Laura Prance, formerly of the Baton Rouge General Hospital, Baton Rouge, Louisiana, has accepted a position as assistant dietitian at St. Luke's Hospital.

Helen Lynch has resigned her position at Stuart Circle Hospital to accept a position with the government at Fort Custer. Lorraine Corbitt, formerly at Hood College, Frederick, Maryland, has replaced Miss Lynch at Stuart Circle Hospital.

The Medical College of Virginia Hospital has added four new members to their dietary staff: Nancy McCall, formerly of Pennsylvania Hospital, Philadelphia; Florence Pond, Knickerbocker Hospital, New York; Mary Stare, Illinois School for the Deaf, Jacksonville, Illinois; and Ida Straeber, Dixie Hospital, Hampton, Virginia.

West Virginia Dietitians have been invited by the West Virginia Home Economics Association to attend their state meeting May 2–3 at Jackson's Mill since the former group have not as yet organized a state dietetic association.

News from Our Advertisers and Exhibitors. The Home Economics Division, *National Canners Association*, in cooperation with the Northwest Laboratory, have compiled an interesting booklet on the preparation and use of canned salmon. A brief history of salmon is presented, the process of preparation and canning, its value as a food, and various appetizing recipes and luncheon and supper menus. Copies of this booklet may be obtained from the National Canners Association, Washington, D. C.

Ralston Purina Company, St. Louis, Missouri, have available for distribution several new

How to Buy Fine Quality Lamb

How to Serve It in Three Appealing Meals

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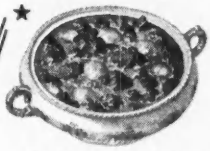
Armour's Star Lamb Buying Guide for Budgeteers



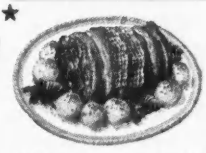
THRIFT BANQUET NO. 1

Here's a favorite of gourmets and budgeteers alike! It's Star Lamb Breast or Flank, transformed into a savory, bubbling stew or curry, with lots and lots of hearty, lean meat. Easy to fix: Brown the floured lean pieces of meat first. Then add 2 cups water, seasonings of salt and pepper, 1 onion, 1 carrot. Simmer 2 hours. Add vegetables or season with ¼ teaspoon curry powder, and serve with rice.

Be a Lamb Expert. It's Easy!

Look for the Armour's Star Brand on every major cut. Look for the Government Inspection Stamp.

Look for lean meat of a dull pink color and fine, firm texture. Look for hard, pinkish white fat, in abundance. Look for pink-white bone. Those are basic guides. Follow them, and you can't go wrong.



THRIFT BANQUET NO. 2

Ever serve a Star Lamb Shoulder Roast? If not, you've a treat coming! For this delicious dish brings cheers, yet helps cut down food costs surprisingly! Have shoulder cut, boned and rolled. Season with salt and pepper, and roast uncovered in 325°F. oven for 35 minutes to the pound. Cover top with strips of Star Bacon for flavor. Serve with spring vegetables. Serves 3 to the pound.

That Star Brand Means Just This . . .

That Star Brand goes only on lamb which corresponds to the strict, impartial Government Grade of Prime or Choice.

And of course all Star Lamb is processed by experts . . . trimmed and chilled in such a way that you get the maximum of fine lamb from every cut you buy. It takes skill, experience and money to prepare lamb like Armour's Star . . . but it's worth it to you.

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Lamb chops aren't expensive . . . if you'll just say "Star Lamb *Shoulder* Chops, please." That makes an appreciable difference in cost...yet assures you very tasty, highly nutritious lamb chops with plenty of lean meat on each one. Broil them, and serve with broiled tomatoes or broiled pears.

A Word About Food Values

Most people eat lamb because they like it. But there's another good reason for eating lamb . . . its high nutritive value.

Fine lamb, like other lean meats, is an important source of complete proteins, contains a rich store of phosphorus, some iron and copper. It provides a good measure of those important Vitamin B factors, thiamin and riboflavin.

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books on whole grains. "Whole Wheat and Its Importance as a Natural Source of Vitamin B_1" is a summary of current literature on this important vitamin. Complete charts on vitamin and mineral requirements and distribution, essentials of an adequate diet, and comparison of milling methods are included. Ralston Wheat Cereal is made from whole wheat with wheat germ added to bring the vitamin B_1 value to 65 I.U. per ounce. For infant feeding, in anorexia, for convalescents, pregnant and nursing mothers, and in the normal diet it serves as an excellent source of vitamin B_1 and iron. "Why Rye" gives nutritional information on whole rye and its growing importance as a staple food in normal and special diets. Special emphasis is given to the use of Ry-Krisp in low calorie and allergy diets, since each wafer furnishes only 23 calories.

The baby's first solid food always excites the parent's interest. Will he cry? Will he spit it up? Will he try to swallow the spoon? Far more important than the child's "cute" reactions is the fact that figuratively and physiologically, the little fellow is just beginning to eat like a man. Many a parent, with limited knowledge of nutrition, attempts to do the baby's tasting for him. Partial to sweets, the mother sweetens her child's cereal. Disliking cod liver oil, she wrinkles her nose and sighs: "Poor child, to have to take such awful stuff!" The child is quick to learn by example, and soon may become poor indeed—in nutrition, as well as in mental habits and psychological adjustment. Appreciating the importance and difficulties of the physician's problem in establishing and maintaining good eating habits, *Mead Johnson & Company* continue to supply Pablum in its natural form. No sugar is added. There is no corresponding dilution of the present protein, mineral and vitamin content of Pablum.

Wyandotte service representatives and office executives of the *J. B. Ford Sales Company* held a "Preparedness" conference at the Statler Hotel, Cleveland, February 27–28. The important part that cleaning operations of all kinds are playing in our present national defense efforts was the featured topic of this conference. Metal cleaning operations of all kinds, dishwashing, laundering, and sanitation in food and beverage plants are naturally the most prominent cleaning operations in the present preparedness emergency. In addition, shells and shell casings, beverage bottles, anti-aircraft gun parts, Army and Navy blankets, steel helmets, aluminum castings, and hundreds of thousands of soiled dishes and pieces of silverware are but a few of the many items in the national preparedness program that are daily being cleaned or washed with a Wyandotte product. Wyandotte is a family name applied to more than 100 different specialized cleaning materials.

The Cream of Wheat Corporation, Minneapolis, through its representative, Mr. Robert R. Helmerichs, reports that the vitamin B_1 content of 5-Minute "Cream of Wheat" has been materially increased. In addition to stabilized wheat germ of high vitamin content, pure thiamin is now being added. Each ounce (dry weight) now contains 50 I.U. vitamin B_1. A card is available which gives a complete analysis of 5-Minute "Cream of Wheat." Copies are free upon application.

The Aluminum Cooking Utensil Co., New Kensington, Kentucky, makers of "Wear-Ever" aluminumware, presents the following statement in explanation of the recently publicized aluminum shortage from the February 24 issue of *Retailing:* " 'Defense first' is the slogan of the aluminum cooking utensil industry as well as other housewares fields. The present temporary curtailment of utensil manufacturing for civilian purposes should soon be offset by the large increase in aluminum ingot production now coming in. The present metal shortage is due to the needs of defense purposes. Aluminum cooking utensil manufacturers while engaged in national defense orders are only partially equipped to handle high strength aluminum alloys required for major defense uses and are necessarily maintaining their plants for expansion in domestic manufacture as soon as the temporary metal shortage is over. The manufacturers of aluminum cooking utensils are only one of many industries affected by the recent rapid growth of the use of aluminum for national defense purposes. Members of the Aluminum Wares Association are urging their customers to buy orly such utensils as will maintain in retail outlets modest, reasonably diversified stocks. This, the manufacturers feel, will prevent immediate shortages with key items and reduce warehouse stocks proportionately throughout the various lines. By this method, over what should be a period of limited duration, the cooking utensil companies and dealers working together will secure best mutual results; otherwise there might be a very bad temporary situation."

Do not confuse KNOX PLAIN *(Sparkling)* GELATINE (U.S.P.) with inferior grades of gelatine or with pre-flavored, sugar-laden dessert powders. Knox Gelatine contains absolutely no sugar or other substances to cause gas or fermentation. It is manufactured with twenty-one laboratory tests, including rigid bacteriological control to maintain purity and quality. Knox Gelatine is dependable for uniformity and strength. Your hospital will procure it for your patients, if you specify Knox by name.

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All gelatine.	Only contain 10% to 12% gelatine.
Protein 85% to 87%.	Protein 10% to 12%.
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Absolutely no sugar.	85% sugar average.
No flavoring. No coloring. Odorless. Tasteless. Blends well with practically any food.	Contain flavoring, acid and coloring matter.
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HAVE YOU HEARD?

This month's contributions are from the members of the Michigan Dietetic Association and were compiled by Gladys Enke of St. Mary's Hospital, Detroit.

A new measuring spoon with an adjustable partition for measuring any fraction of a tablespoon, takes the place of the old dangling set of measuring spoons.

The difficulty of moving heavy garbage cans can furnish a good excuse for not scrubbing behind them. Why not place cans on a triangular-shaped angle iron platform with a heavy castor at each point of the triangle? Any shop man can make them for you. Similar platforms are available commercially at no great cost.

A clever tinner can make a cover to fit over the tops of the large mixing bowls and prevent splashing of contents.

Some dietitians have found the use of half-pint milk bottles a sanitary and efficient method for distributing nourishments. These bottles can be attractively marked with the name of the hospital in script at the time of manufacture. Bottle caps can be printed with the name, room, nourishment and time listed in small letters followed by a blank line which may be filled in with each particular order from the daily requisition sheet. Bottle caps with a pull tab under which is a punched hole are preferable, for it is then possible to insert a bent glass straw through the cap leaving no space for dust to enter in case the patient does not care to drink his beverage at once. Caps are very inexpensive, and bottles cost about three cents apiece. Patients like these containers because they are easier to hold, the straw is a convenience, and they give the impression of greater cleanliness. Nursing supervisors say they like them because ward helpers remove the empty bottles from the bedside more quickly than the used glass. We like them because they reduce the cost of replacement to less than one-third that formerly spent for glass breakage. The bottles are more durable and do not break as easily. Moreover, they are not kept on the wards for water glasses.

The dietitian who instructs diabetic patients in injecting insulin, may find a wire strainer which fits the pan useful in sterilizing the syringe and needle. This method lessens the possibility of breakage of the syringe when the water is poured out of the pan.

A swirl mixer is available in the form of a covered measuring cup which mixes thickening for gravies, stews, white sauces, etc., without lumping. The flour and liquid may be measured directly in the cup and contents shaken vigorously against the swirls.

Have you tried using one of the newer, easily soluble coffees for making up that single cup of coffee at odd hours?

For those who make a large number of hamburgers, try putting the meat mixture into loaf pans and place in the freezing unit overnight. When ready for use, slice on meat slicer and complete preparation in usual manner. This gives a hamburger of uniform size and thickness.

Whole kernel corn and egg added to baking powder biscuits and served with creamed chicken make a delicious shortcake.

You can give color to Scotch shortbread by adding mixed candied fruits.

A surplus of freshly baked frankfurter and hamburger buns may be kept indefinitely if frozen. When ready for use, thaw quickly at a high temperature.

Have you ever been in a hurry to make a lot of cut-out cookies, when transferring each cookie from the board to the baking-sheet seemed an endless process? Next time try fitting a piece of delicatessen paper across the baking sheet; roll the dough out on the paper; cut the cookies, then pick out the pieces of dough between cookies and bake right on the paper-covered sheet. It saves lots of time.

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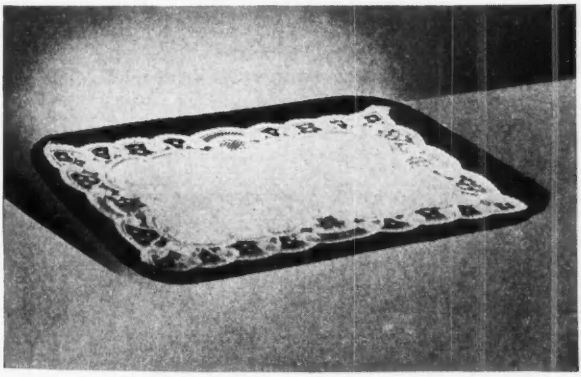

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The Home Economics Department of the Battle Creek Food Company is making quite an elaborate collection of wheat germ recipes. They have figured that adding one teaspoon of wheat germ to a cup of white flour makes the flour approximately equal to whole wheat in the vitamins of the entire grain. They are also working on new and more palatable recipes for the soy bean and offer "Soy Daffodil" cake as one of their best.

Try this idea for brightening up a punch bowl. Melt a depression in the ice about 1½" deep and 5" in diameter in the block of ice for the punch bowl. A bowl of warm water set on the ice will do it. Then fill in the depression with fruit and mint. If the fruit happens to be cranberries, have you ever tried dipping it in syrup first? This will make it shine and hold the fruit together. Here are the directions: Put ⅔ cup sugar and ⅔ cup water in a small saucepan; boil with constant stirring for one minute, and cool slightly; dip the cranberries in this syrup, using a strainer, and spread them on a rack to cool; dip and cool again. Kumquats, so treated, make a nice garnish for a citrus punch.

Here is a formula for a liquid to be used in removing greese and dirt from stainless steel hoods, etc.: 1 pt. ammonia, 2 cups sal soda, 1 pt. vinegar, 1½ pts. boiling water.

Meeting the Present Shortage of Professional Personnel

What has been said with reference to the nursing department may also be applied, in a general way, to our laboratory and x-ray departments. Wherever an institution is large enough to employ more than one person in these departments there is no question but that the work can be reassigned and non-technical duties performed by those who have not received technical training but are still capable of rendering routine service. There are many duties in all our departments now being performed by technically trained individuals who are being paid commensurate salaries, that could be performed by others under proper supervision, just as efficiently, and at less expense.—*Barnes, H. S., Efficiency with reduced professional and technical personnel, Hospitals, April, 1941.*

The *Jim Vaughan*

Electric Meat, Fish and Bone Cutter

The "Jim Vaughan" is gaining increased popularity and favor among leading dietitians. There are many good reasons why this modern piece of equipment is rapidly taking its place in the modern hospital kitchen.

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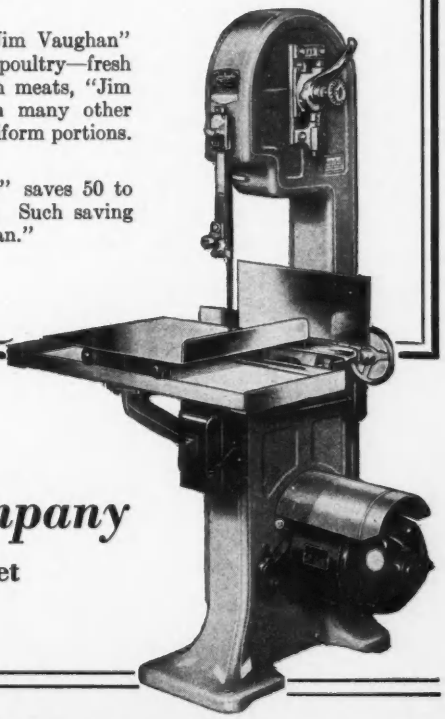

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WHO'S WHO IN THIS ISSUE

R. R. Williams, B.S., M.S., University of Chicago; Sc.D., (honorary) Ottawa (Kansas) University and Ohio Wesleyan University, is a noted chemist, having been granted the Willard Gibbs Medal in 1934 for his work on thiamin. In 1933 Dr. Williams and his associates succeeded in isolating sufficient thiamin from rice polishings for a concerted effort to determine its structure, and in 1936 he and his associates were the first to make a complete synthesis of thiamin. Dr. Williams is the senior author with Dr. Tom D. Spies of *Vitamin B_1 (Thiamin) and Its Use in Medicine*. His interest in the therapy of beriberi dates from his government service in the Philippines in 1910 where he began attempts to isolate the protective substance from rice polishings. Dr. Williams is a member of the American Chemical Society and the Society of Experimental Biology and Medicine. Since 1925 he has been chemical director of the Bell Telephone Laboratories, New York.

Dana W. Atchley, M.D., is associate professor of medicine, Columbia Medical School, and associate attending physician at the Presbyterian Hospital, New York.

Alfred I. Hess is in the Engineering and Maintenance Department, Kodak Park Works, Eastman Kodak Company.

Howard H. Beard, A.M., Ph.D., is professor of biochemistry, Louisiana State University, School of Medicine, New Orleans. He received the A.M. degree from Columbia University in 1921 where he worked under Professor Henry C. Sherman, and the Ph.D. degree at Yale in 1925 under the late Professor Lafayette B. Mendel. He was assistant professor of biochemistry, Western Reserve University School of Medicine, from 1925 until 1930. **Philip Pizzolato,** M.D., Louisiana State University, School of Medicine, is also a graduate of Tulane University. He is at present serving his second year of internship at Charity Hospital.

William W. Prouty received the B.S. degree from the University of Minnesota in 1937, majoring in biochemistry. Mr. Prouty is a member of the American Association of Cereal Chemists and a charter member of the Institute of Food Technologists. At present he is with the research department of the American Institute of Baking. **William H. Cathcart,** Ph.D., was noted under this section of the January 1941 JOURNAL.

Eleanora Sense, chairman of Press Relations for the American Dietetic Association, received her master's degree from the University of Wisconsin.

Pauline Dill Swanson, B.S., University of Colorado, graduate of Michael Reese Hospital Course for Student Dietitians, is head dietitian at Colorado General Hospital.

Ella M. Eck, chief dietitian at the University Clinics, University of Chicago, and member of the Journal Board, was a contributor to this JOURNAL for February 1938 and was noted under this section at that time.